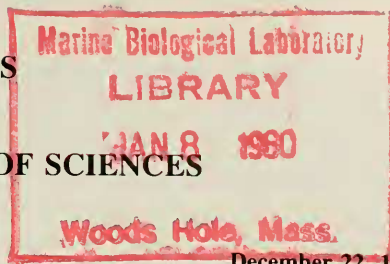


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STUDIES ON THE NEBRIINI (COLEOPTERA: CARABIDAE), III.¹
NEW NEARCTIC *NEBRIA* SPECIES AND SUBSPECIES,
NOMENCLATURAL NOTES, AND LECTOTYPE DESIGNATIONS²

By

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ABSTRACT: The purpose of this paper, third of a series on the nebriine carabid beetles, is to upgrade the status of nomenclature for Nearctic members of genus *Nebria* in preparation for subsequent papers on classification, phylogeny, zoogeography, and natural history of members of the Nearctic fauna. Names are provided for five undescribed species [*Nebria carri* (type-locality—Dollarhide Summit, Idaho), *N. darlingtoni* (type-locality—South Fork American River, California), *N. gouleti* (type-locality—Rattlesnake Creek, Washington), *N. lituyae* (type-locality—Mount Blunt, Lituya Bay, Alaska), and *N. navajo* (type-locality—19 miles SW of Kayenta, Arizona)]. Twenty-three subspecies are also described as new [*Nebria acuta* quileute, *N. arkansana edwardsi*, *N. arkansana oowah*, *N. arkansana uinta*, *N. fragilis teewinot*, *N. gebleri cascadenae*, *N. gebleri fragariae*, *N. gebleri siskiyouensis*, *N. gyllenhali lassenensis*, *N. gyllenhali lindrothi*, *N. kincaidi balli*, *N. lacustris bellorum*, *N. meanyi lamarckensis*, *N. meanyi sylvatica*, *N. nivalis gaspesiana*, *N. obliqua chuskae*, *N. sahlbergii modoc*, *N. sahlbergii triad*, *N. schwarzi beverlianna*, *N. spatulata sierrae*, *N. trifaria utahensis*, *N. vandykei wyeast*, and *N. zioni oasis*]. Diagnosis and comment on geographical distribution are provided for each new taxon. Lectotypes are designated for *Carabus gyllenhali* Schönherr, *C. nivalis* Paykull, *Helobia castanipes* Kirby, *Nebria bifaria* Mannerheim, *N. eschscholtzii* Ménétriés, *N. gregaria* Fischer von Waldheim, *N. hudsonica* LeConte, *N. ingens* Horn, *N. livida* LeConte, *N. mannerheimii* Fischer von Waldheim, *N. metallica* Fischer von Waldheim, *N. mollis* Motschulsky, *N. moesta* LeConte, *N. obliqua* LeConte, *N. sahlbergii* Fischer von Waldheim, *N. suturalis* LeConte, *N. trifaria* LeConte, *N. vandykei* Bänninger, *N. violacea* Motschulsky, and *N. viridis* Horn. *Nebria longula* LeConte and *N. obtusa* LeConte are recognized as junior synonyms of *N. suturalis* LeConte and *N. obliqua* LeConte, respectively. *Nebria rathvoni* LeConte is reduced in status to a subspecies of *N. gebleri* Dejean. Emendations or restrictions of type-localities are provided for *Nebria catenata* Casey, *N. eschscholtzii* Ménétriés, *N. expansa* Casey, *N. hudsonica* LeConte, *N. incerta* Casey, *N. ingens* Horn, *N. longula* LeConte, *N. obliqua* LeConte, *N. oregona* Casey, *N. ovipennis* LeConte, and *N. tenuipes* Casey. Additional notes on type-specimens and nomenclature are provided for other species group names.

INTRODUCTION

¹ Papers which serve as contributions I and II in this series are, respectively, Kavanaugh (1971) and Kavanaugh and Martinko (1972).

² Data presented here have been extracted from the author's unpublished Doctoral Dissertation, submitted to the University of Alberta, Edmonton, September 1978 (Kavanaugh 1978).

My interest in beetles of the genus *Nebria* Latreille began in 1967. While collecting carabid beetles in the Rocky Mountains of Colorado, I concentrated on my own preferred haunts—namely, riparian, nival, and peri-nival habitats. This specialization provided frequent encoun-

ters with members of various *Nebria* species because, in these habitats, few insect groups approach *Nebria* in their conspicuous abundance. With the aid of Lindroth's (1961) treatment of the genus for Canada and Alaska, I was able to identify most of my material. It soon became evident that *Nebria* species formed a biologically important and interesting element of the montane fauna. Species diversity and population densities in suitable microhabitats were impressively high, and I began to recognize patterns of altitudinal zonation among the resident species. Observations made on collecting trips to montane areas in Utah and California suggested that similar patterns of *Nebria* species diversity and habitat distribution existed in these and other areas in western North America.

The opportunity to begin serious study of Nearctic *Nebria* appeared in July 1970, when I enrolled at the University of Alberta, Edmonton. Although Nearctic *Nebria* species were at that time already among the taxonomically better-known carabid groups, I hoped to build on my previous interest and experience through additional studies which seemed both feasible and potentially rewarding scientifically. My plan was to obtain data with which to further define the structural and distributional limits of Nearctic species and explore the evolutionary relationships among them. Initial goals were the formulation of an improved infrageneric classification of the New World species and generation of hypotheses concerning the historical development of diversity and distributional patterns observed in the fauna.

Nebria, in the broadest sense, comprises a group of over 500 nominal taxa which, in aggregate, demonstrate Holarctic distribution. The Palaearctic component of the genus is more diverse, both in species and major lineages, than the Nearctic. Consequently, all hypotheses on relationships among Nearctic species and on historical development of the Nearctic fauna would be highly speculative in the absence of a working knowledge of the Palaearctic fauna. Fortunately, as work toward the initial project goals progressed, new sources of taxonomic data became available as by-products of field work and efforts to obtain comparative material on loan. These additional resources have permitted expansion of the project to include coverage of the Palaearctic *Nebria* fauna, compar-

isons with members of other nebrine genera and related carabid tribes, and the use of additional character systems in study of the Nearctic *Nebria* fauna. These other systems include external structure of immature stage individuals, life history features (especially life cycle timing), habitat preferences, and adult internal structure.

Various facets of the expanded project have progressed at different rates, and some of these are yet incomplete or barely begun. This paper represents a first report on the Nearctic *Nebria* fauna, specifically on nomenclature relating to same. My purpose is twofold. First, I provide names for five species and 23 subspecies not previously described. These names are needed immediately for use in several other manuscripts and by several other workers. To this end, data and discussion presented for each name are limited to little more than the minimum required by the *International Code of Zoological Nomenclature* for availability. My second purpose is to provide additional notes on nomenclature for previously described Nearctic species, including emendations and/or restrictions of type-localities, notes on type-specimens, and designations of lectotypes.

In a subsequent paper (manuscript in preparation) I will present additional information on Nearctic *Nebria* taxa, including those presented here as new. Each taxon will be more fully described and illustrated. A classification and key for identification of adults will be provided, as will results of comparative studies on structure, distribution, and natural history. A review of the known fossil record of Nearctic *Nebria* will also be included.

MATERIALS

This study is based on examination of over 66,000 Nearctic and 5,800 Palaearctic adult *Nebria* specimens. Approximately 35,000 specimens were borrowed from various institutional and private collections in North America, Europe, and Asia. Following is a list of abbreviations used in the text which refer to various collections from which specimens were received. Most, but not all, correspond to abbreviations proposed by Arnett and Samuelson (1969). Where appropriate, names of curators or assistants who sent specimens are also included.

AHab—A. Habu, National Institute of Agricultural Sciences, Tokyo, Japan.

- ALar—A. Larochelle, Collège Bourget, Rigaud, Québec J0P 1P0.
- AMor—A. Morgan and A. V. Morgan, University of Waterloo, Waterloo, Ontario N2L 3G1.
- AMNH—American Museum of Natural History, New York, New York 10024; L. H. Herman, Jr.
- ANSP—Academy of Natural Sciences, Philadelphia, Pennsylvania 19103; W. W. Moss.
- BFCa—B. F. Carr, 24 Dalrymple Green NW, Calgary, Alberta T3A 1Y2.
- BMNH—British Museum (Natural History), London, England; P. M. Hammond, H. K. Kenward, M. E. Bacchus.
- BRot—B. Rotger, CR., Immaculate Heart of Mary Church, P.O. Box 451, Pagosa Springs, Colorado 81147.
- CArm—C. Armin, 191 West Palm Avenue, Reedley, California 93654.
- CAS—California Academy of Sciences, San Francisco, California 94118; H. B. Leech.
- CDA—California State Department of Food and Agriculture, Sacramento, California 95814; F. G. Andrews.
- CNC—Canadian National Collection of Insects, Biosystematics Research Institute, Ottawa, Ontario K1A 0C6; R. de Ruelle, A. Smetana.
- CSU—Colorado State University, Fort Collins, Colorado 80521; T. O. Thatcher.
- CUB—University of Colorado, Boulder, Colorado 80302; H. Rodeck.
- CUIC—Cornell University, Ithaca, New York 14850; L. L. Pechuman.
- DBUM—Université de Montreal, Montreal, Québec H3C 3J7; M. Coulloudon.
- DENH—University of New Hampshire, Durham, New Hampshire 03824; W. J. Morse.
- DEUN—University of Nebraska, Lincoln, Nebraska 68503; B. C. Ratcliffe.
- DHKA—D. H. Kavanaugh, California Academy of Sciences, San Francisco, California 94118.
- DJLa—D. J. Larson, Department of Biology, Memorial University of Newfoundland, St. John's, Newfoundland A1C 5S7.
- DMan—D. Mann, University of Washington, Seattle, Washington 98195.
- DRWh—D. R. Whitehead, Systematic Entomology Laboratory, U.S.D.A., % United States National Museum, Washington D.C. 20560.
- DZEC—Montana State University, Bozeman, Montana 59715; N. L. Anderson.
- EAMa—E. A. Martinko, University of Kansas, Lawrence, Kansas 66045.
- EDNC—North Carolina Department of Agriculture, Raleigh, North Carolina 27602; J. F. Greene.
- EMUS—Utah State University, Logan, Utah 84332; W. J. Hanson.
- ETHZ—Eidgenössische Technische Hochschule Entomologisches Institut, Zürich, Switzerland; W. Sauter.
- FMNH—Field Museum of Natural History, Chicago, Illinois 60605; H. Dybas.
- GASh—G. A. Shook, 1209 West Hays, Boise, Idaho 83702.
- GRNo—G. R. Noonan, Milwaukee Public Museum, Milwaukee, Wisconsin 53233.
- HGou—H. Goulet, Biosystematics Research Institute, Ottawa, Ontario K1A 0C6.
- HoKn—R. L. Hoffman and L. Knight, Radford College, Radford, Virginia 24141.
- HNHM—Hungarian Natural History Museum, Budapest, Hungary; S. Horvatovitch.
- ICCM—Carnegie Museum, Pittsburgh, Pennsylvania 15213; G. E. Wallace.
- INHS—Illinois Natural History Survey, Urbana, Illinois 61803; M. W. Sanderson.
- ILar—I. La Rivers, University of Nevada, Reno, Nevada 89507.
- ISU—Iowa State University, Ames, Iowa 50010; R. Miller.
- IUC—Indiana University, Bloomington, Indiana 47401; F. N. Young.
- JBel—J. Belicek, 9345-98A Street, Edmonton, Alberta T6E 3N2.
- JKus—J. Kuster, University of Alberta, Edmonton, Alberta T6G 2E3.
- JNeg—J. Nègre, 9 Boulevard de Lesseps, Versailles, France.
- JSch—J. Schuh, 4039 Shasta Way, Klamath Falls, Oregon 97601.
- JSpe—J. Spence, University of Alberta, Edmonton, Alberta T6G 2E3.
- JVMa—J. V. Matthews, Jr., Geological Survey of Canada, Ottawa, Ontario K1A 0E8.
- KMFe—K. M. Fender, 911 Ashwood Avenue, McMinnville, Oregon 97128.
- KSUC—Kansas State University, Manhattan, Kansas 66502; H. D. Blocker.
- KUSM—University of Kansas, Snow Museum, Lawrence, Kansas 66045; G. Byers.
- LACM—Los Angeles County Museum of Natural History, Los Angeles, California 90007; C. L. Hogue.
- LEM—Macdonald College, Lyman Entomological Museum, Ste. Anne de Bellevue, Québec J7V 3N8.
- LRus—L. Russell, 828 NW 27th Street, Corvallis, Oregon 97330.
- MCZ—Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138; J. F. Lawrence.
- MGF—Museum G. Frey, Entomologisches Institut, Tutzing bei München, West Germany; M. Würmli.
- MHNG—Museum d'Histoire Naturelle, Geneva, Switzerland; C. Besuchet.
- MNHP—Muséum National d'Histoire Naturelle, Paris, France; A. Bons, H. Perrin.
- MLLu—M. L. Luff, University of Newcastle, Newcastle-upon-Tyne, England.
- MSU—Michigan State University, East Lansing, Michigan 48823; R. L. Fischer.
- NMB—Naturhistorisches Museum Basel, Basel, Switzerland; W. Wittmer.
- NMDo—N. M. Downie, 505 Lingle Terrace, Lafayette, Indiana 47901.
- NMPC—National Museum in Prague, Prague, Czechoslovakia; Z. Mlynar.
- NRSS—Naturhistoriska Riksmuseet, Stockholm, Sweden; T. Nyholm.
- NSDA—Nevada State Department of Agriculture, Reno, Nevada 89504; R. C. Bechtel.
- ODA—Oregon State Department of Agriculture, Salem, Oregon 97310; R. L. Westcott.
- OSEC—Oklahoma State University, Stillwater, Oklahoma 74074; W. A. Drew.

- OSUC—Ohio State University, Columbus, Ohio 43210; C. A. Triplehorn.
- OSUO—Oregon State University, Corvallis, Oregon 97331; P. Oman.
- PADA—Pennsylvania State Department of Agriculture, Harrisburg, Pennsylvania 17120; T. J. Henry.
- PMCh—P. M. Choate, Jr., University of Florida, Gainesville, Florida 32601.
- PMNH—Peabody Museum of Natural History, Yale University, New Haven, Connecticut 06520; C. L. Remington, K. W. Brown.
- PSMi—P. S. Miliotis, Depot Street, Dunstable, Massachusetts 01827.
- PSUC—Pennsylvania State University, University Park, Pennsylvania 16802; K. C. Kim.
- PUCA—Pacific Union College, Angwin, California 94508; L. E. Eighme.
- PURC—Purdue University, Lafayette, Indiana 47907; A. Provonsha.
- RCGr—R. C. Graves, 627 Crestview, Bowling Green, Ohio 43402.
- RCra—R. Crawford, University of Washington, Seattle, Washington 98195.
- RDav—R. Davidson, University of Vermont, Burlington, Vermont 05401.
- RFre—R. Freitag, Lakehead University, Thunder Bay, Ontario P7B 5E1.
- ROM—Royal Ontario Museum, Toronto, Ontario M5S 2C6; G. B. Wiggins.
- RPPa—R. P. Papp, Bernice P. Bishop Museum, Honolulu, Hawaii 96818.
- RTBe—R. T. Bell, University of Vermont, Burlington, Vermont 05401.
- SFVS—California State University, Northridge, California 91324; P. F. Bellinger.
- SDSU—South Dakota State University, Brookings, South Dakota 57006; E. U. Balsbaugh, Jr.
- SJSU—San Jose State University, San Jose, California 95114; J. G. Edwards.
- TCBa—T. C. Barr, Jr., University of Kentucky, Lexington, Kentucky 40506.
- TNak—T. Nakane, National Science Museum, Tokyo, Japan.
- TMZM—Tromsø Museum, Tromsø, Norway; J. H. Andersen.
- UAFA—University of Arkansas, Fayetteville, Arkansas 72701; R. T. Allen.
- UASM—University of Alberta, Strickland Museum, Edmonton, Alberta T6G 2E3; G. E. Ball.
- UBC—University of British Columbia, Spencer Museum, Vancouver, British Columbia V6T 1W5; G. G. E. Scudder.
- UCB—University of California, Essig Museum of Entomology, Berkeley, California 94720; J. A. Chemsak.
- UCD—University of California, Davis, California 95616; R. O. Schuster.
- UCR—University of California, Riverside, California 92502; S. Frommer.
- UIMI—University of Idaho, Moscow, Idaho 83843; W. F. Barr.
- UMHF—Universitetets Zoologiska Museum Entomologiska Avdelningen, Helsingfors, Finland; H. Silfverberg.
- UMMZ—University of Michigan, Ann Arbor, Michigan 48104; R. D. Alexander.
- UMRM—University of Missouri, Columbia, Missouri 65201; W. R. Enns.
- UMTF—University of Turku, Turku (Åbo), Finland; H. Hippa.
- USNM—United States National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560; T. L. Erwin.
- UWBM—University of Washington, Burke Museum, Seattle, Washington 98105; M. H. Hatch, S. Rohwer.
- UWEM—University of Wisconsin, Madison, Wisconsin 53706; L. J. Bayer.
- UWLW—University of Wyoming, Laramie, Wyoming 83070; R. J. Lavigne.
- VMKi—V. M. Kirk, Northern Grain Insects Research Laboratories, Brookings, South Dakota 57006.
- WSU—Washington State University, Pullman, Washington 99163; W. J. Turner.
- ZILR—Zoological Institute, Academy of Science, Leningrad, U.S.S.R.; O. L. Kryzhanovskij, V. G. Shilenkov.
- ZMKD—Universitetets Zoologiske Museum, København, Denmark; O. Martin.
- ZMLS—Zoological Institute, University of Lund, Lund, Sweden; C. H. Lindroth.
- ZMUM—Zoological Museum, Moscow University, Moscow, U.S.S.R.; S. Keleinkova.
- ZSBS—Zoologische Sammlung des Bayerischen Staates, München 19, West Germany; G. Scherer.

I have been able to study the type-specimens of all 85 previously described Nearctic nominal taxa through the cooperation of many of the curators listed above. The following three minor nomenclatural problems must remain unsolved, but none, I think, will require further attention. *Nebria melsheimeri* Sturm (1826:173) and *Nebria eschscholtzii* Sturm (1826:173) (not of Ménériés) must be considered *nomina nuda* because these names appear only in Sturm's catalog to his collection, unaccompanied by either description or statement of locality; and no type-specimens exist. The problem with and current status of the name *Nebria elias* Motschulsky is discussed with a treatment of *Nebria gyllenhali* (Schönherr) below.

Where necessary, lectotypes have been chosen and so labelled, and their formal designations appear here. I have also labelled holotypes for previously described species names where prior labels were unclear or lacking. Holotypes designated for taxa described here as new (with the exception of the holotype of *N. trifaria utahensis* n. ssp.) have been deposited in the type collection of the California Academy of Sciences.

METHODS

A detailed discussion of preparative and procedural methods used in this project will be in-

cluded in a subsequent paper (Kavanaugh, manuscript in preparation). I present here comment on only those methods which relate specifically to data and results presented in this paper.

DISSECTING TECHNIQUES.—Characters used in diagnoses of many taxa named here include form of the hindwings and genitalia of adults. Successful examination of these structures required some dissection. Specimens were prepared for dissection by soaking them for 5 or 10 minutes in boiling water. Addition of a very small amount of liquid detergent hastened the relaxation process. Specimens collected in ethyl acetate fumes were relaxed easily, but material collected in potassium cyanide fumes or in ethyl alcohol required a brief (two to five minute) treatment in warm potassium hydroxide (10% solution).

A general impression of the size (but not shape) of the hindwings was obtained by simply lifting the left elytron to expose the wing. For a study of venation and wing shape, the left hindwing was torn free at the wing base using fine forceps, then spread and mounted in alcohol on a slide. Permanent mounts (in Euparal medium) were made for representatives of all taxa studied; however, most hindwings were later dried, glued to cards, and pinned with their respective specimens.

The apex and shaft of the median lobe and parameres in male specimens or the coxostyli in female specimens were quickly examined in relaxed specimens by simple eversion of these structures using fine forceps. For study of the base of the median lobe in males or the spermatheca, bursa copulatrix, and other internal structures in females, the genitalia were extracted as a unit by tearing the membranous connections between eighth tergum and sternum and the "ring sclerite" (in males) or the valvifers, paraprocts, and proctiger (in females). Genitalia were next treated for 5 to 10 minutes in hot (10%) potassium hydroxide solution to remove nonsclerotized tissue, rinsed in water, further dissected as needed, then transferred to and examined in glycerine. After genitalic specimens were studied and drawn, they were placed in polyethylene microvials in a drop of glycerine and pinned with their respective specimens.

SEX DETERMINATION.—Determination of the sex of individuals was made simply by reference

to form of the front tarsi. Adult males have the basal three or four tarsomeres dilated, laterally expanded, and have pads of adhesive setae on ventral surfaces of the basal two or three tarsomeres. Females have all tarsomeres slender and without ventral pads of adhesive setae.

MEASUREMENTS.—The only mensural character used in this study is "standardized body length." This expression refers to the sum of three measurements (Fig. 1A): length of head, measured along midline from apical margin of clypeus to a point opposite posterior margin of eye; length of pronotum, measured along midline from apical to basal margin; and length of elytron, measured along midline from apex of scutellum to a point opposite elytral apex. While this measure of relative size avoids error due to variation in extension or retraction of body parts among specimens, it consistently underestimates the apparent total body length of specimens (such as could be measured from the most anterior to the most posterior point) by from 12 to 18 percent.

Range in standardized body length in my sample for each taxon was established by visual selection of smallest and largest specimens for each sex. All measurements were made with the aid of a Leitz stereoscopic dissecting microscope at a magnification of 16 diameters, using a calibrated ocular grid with a scale interval of 0.1 mm.

ILLUSTRATIONS AND MAPS.—Line drawings illustrating structural characters were made with the aid of an ocular grid mounted in a Leitz stereoscopic dissecting microscope. Unless otherwise noted, scale lines which accompany illustrations equal 1.0 mm. All drawings of homologous structures are consistent in scale and aspect to facilitate comparisons. In some drawings, uniform sparse stippling is used to indicate membranous areas. Where only part of a structure is illustrated (such as the basal region of an elytron), a wavy line serves as the artificial margin of the drawing.

Maps are presented to illustrate known distributions of taxa. Symbols used denote approximate locations of samples (see taxon descriptions for respective lists of sample localities). (Written permission has been obtained for use of Goode Base Map No. 202 [or parts thereof] [copyright by the University of Chicago, Department of Geography].)

FORMAT FOR PRESENTATION OF NEW TAXA.—Included for each new name are: a synonymy (i.e., list of names which have been misapplied in the literature to members of this taxon, including all known literature records); designations and listings of type-specimens and their places of deposition; designation of type-locality; the diagnostic combination (i.e., those character states which, in combination, distinguish members of the taxon from members of other taxa); derivation of the taxon name; a brief synopsis of geographical distribution; and a list of localities (including months of collection and place of deposition) for paratypes.

Several comments are required on the format and data content of the locality lists. For convenience, all data (including countries, states or provinces, counties, and localities) are arranged alphabetically. All records are from specimens I have personally studied. Records solely from the literature are not included here. The geographical subdivisions "County" or "Comté" are used where possible as an aid in organizing the data. Provinces and states for which these subdivisions are not used include: Alberta, British Columbia, Manitoba, Saskatchewan, Yukon Territory, and Alaska. All national parks are treated as counties; and all localities within park boundaries are listed under the park rather than under their appropriate counties. Because altitude data are often important in defining the habitat ranges of *Nebria* taxa, these data are recorded here where known. No attempt has been made, however, to present altitude data not actually recorded on the specimen labels. Where necessary, altitude values have been converted to their metric equivalents.

Only the months in which specimens were actually collected at a given locality have been noted here. This level of precision adequately describes the temporal distributions of most samples. The addition of year and day data would have expanded the size of this paper greatly but contributed little. I have also omitted the names of collectors in order to conserve space. Collections in which specimens are deposited are noted for each locality, but holdings for each collection are not itemized.

Specimens with illegible or essentially meaningless locality labels are grouped with specimens bearing no locality labels under the heading "SPECIMENS WITHOUT LOCALITY DATA." Specimens listed under the heading "DOUBTFUL

RECORDS" are of two types: (1) those labelled as from localities outside the known and probable ranges of the taxon; and (2) those labelled as from localities within the known geographical range of a taxon but from areas where I am certain no suitable habitat for the beetles exists. For some specimens in category (2), however, where appropriate habitat can be found within reasonable proximity of the stated locality, I have chosen to add the word "area" after the entry. Although imprecise, this convention accommodates the common practice among some collectors of simply recording the nearest city or town on specimen labels rather than more precise locality data.

CRITERIA FOR RANKING TAXA.—All available evidence supports the universality of sexual reproduction among nebrine species. Because apparently all *Nebria* species are bisexual, I accept as appropriate Mayr's (1969:26) proposed definition of the biological species (as amended by Whitehead 1972:139), namely, that species are populations or groups of populations through which gene flow actually or potentially exists, but which are reproductively [intrinsically] isolated from all other such populations [or groups of populations]. As noted by Whitehead (1972:139) and Larson (1975:251), the species so defined is a category with a nonarbitrary, objective basis; but this applies only to the extent that interspecific hybridization is excluded or non-introgressive. Success in application of this species definition to the recognition of contemporary species and, therefore, the "objective" bases of taxa recognized depend on the degree to which reproductive isolation can be demonstrated or inferred where it exists and excluded where it does not. Direct, unequivocal evidence for this intrinsic isolation or lack of same can seldom, if ever, be provided, even from breeding tests. Only criteria by which indirect evidence can be evaluated are generally useful.

The following working criteria were used in recognizing species. Two sympatric or parapatric forms were considered separate species if all individuals (of one or both sexes) of one differ from all members (of the same or both sexes) of the other in one or more structural characters (other than color or size). In practice, members of sympatric or parapatric *Nebria* species generally differ in several characters and therefore easily fulfill this criterion. Two allopatric forms were considered separate species if differences

between members of each are roughly equivalent to differences between members of two closely related sympatric species AND if members of geographically intermediate populations of either fail to exhibit intermediate character states for the differentiating characters. Use of the above criteria required the following assumption: that continuity or discontinuity in characters of external structure, internal genitalic structure, geographical and habitat distribution, and life history provided by the study of population samples (comprised of individuals and groups of same) is evidence of reproductive continuity or isolation, respectively, among natural populations. Clearly, recognition of allopatric species is more arbitrary than distinguishing sympatric or parapatric species; but hypotheses about relationship must be drawn from available evidence, and some estimate of these relationships is preferable to none.

I accept the subspecies definition of Edwards (1956b:230) in slightly altered form; namely, that subspecies are populations or groups of populations whose members are recognizably different from members of other conspecific populations and would interbreed with the latter IF they occurred sympatrically and synchronously (under natural conditions) BUT are distinctly isolated from them during their mating periods.

THE SUBSPECIES CATEGORY.—I frequently used the subspecies category in ranking allopatric *Nebria* populations and population groups because patterns of geographical variation are often such that discontinuities in structural and other characters correlate well with discontinuities in habitat or physiography (see also Ball 1966; and Ball and Nègre 1972). Other workers (Erwin 1970; Madge 1967; Noonan 1973; and Whitehead 1976) have avoided use of the subspecies category in their studies of lowland, mainland groups. Recognition of the usefulness of a subspecies concept appears to depend on one's particular perspective; more specifically, on the distribution of habitats or areas occupied by the organisms one studies. Where gaps between areas of suitable habitat are broad and clear, such as with predominantly montane groups like *Nebria*, correlated discontinuity in variation is more confidently recognized and suggestive of active, effective barriers to gene flow.

Because names for subspecies are accorded the same rights and strictures as species names

and compete with the latter for priority under the present *International Code of Zoological Nomenclature*, the description of new subspecies (and resultant introduction of new names into the literature) must be justified. I suggest that recognition of subspecies as defined above is justified because they represent incipient species. They are at present independent evolutionary units whose members are already differentiated from members of other conspecific populations. Because these units are generally of zoogeographic and historical significance, the formal subspecies trinomen is as welcome a "shorthand notation" (Larson 1975:252) as the species binomen or any other formal name.

In addition to the question of usefulness is that of practicality, recognizing inherent difficulties in the formulation and application of a subspecies concept. Use of the subspecies category has been warmly debated for decades (see for example, Brown and Wilson 1954; Edwards 1954, 1956a, 1956b; Inger 1961; and Wilson and Brown 1953). Without question, great variation in subspecies concepts has existed among taxonomists, so that taxa recognized by various workers are seldom equivalent or even comparable units. The inability of taxonomists to formulate and apply a common subspecies concept to their studies is unfortunate but understandable in light of evolutionary theory, which predicts a spectrum of intermediate stages in the process of speciation. Assignment of formal subspecific rank to populations at one particular stage in the process is complicated by the potential for almost infinite variety in evolutionary rate and direction of change.

I agree with Edwards (1954, 1956a, 1956b) that the subspecies as defined above is a relatively objective ("comparatively but not absolutely nonarbitrary" [Simpson 1961:116]) category. Extensive barriers to gene flow between subspecies can, as suggested earlier, be recognized in some instances through detailed studies of habitat and geographical distributions and life histories. These may in fact be easier to demonstrate than intrinsic isolating mechanisms (i.e., reproductive isolation) between separate species. Arbitrariness arises in decisions on "how different" members of allopatric or allochronous populations must be for recognition as either distinct species or conspecific subspecies.

Working criteria I used for recognizing sub-

species were as follows. Two populations or groups of populations were considered separate subspecies if (1) their respective geographical ranges are allopatric and separated by recognizable environmental barriers, (2) differences between members of each are constant but less distinctive than differences between members of two closely related sympatric species in one or more characters of structure, color, or size, AND (3) the geographical pattern of variation in distinguishing characters is nonclinal or distinctly step-clinal. In general, all members of a subspecies can be recognized on structural characters alone. However, in some instances, where two subspecies were recognized as distinct by a step-clinal pattern of variation, all members of one subspecies may be distinguished only from all members of the most proximate populations of the other. A good example of this type of variation pattern is seen for *Nebria lacustris* Casey (see below; details to be presented elsewhere [Kavanaugh, manuscript in preparation]). The following assumption was required for use of the above criteria: that the amount of phenotypic divergence between members of two allopatric populations is a measure not only of the completeness and duration of their extrinsic isolation but also of the probability that reproductive (intrinsic) isolation has evolved between them. Where this assumption is invalid, the resultant error in ranking (i.e., recognizing as subspecies taxa which, in fact, conform to the biological species definition) is, in my opinion, less objectionable than its opposite. If two *de facto* species are ranked as subspecies, close relationship between the taxa is merely overemphasized, and species-group names are still provided and protected by priority. Only changes in status are required if actual relationships are correctly determined later.

NEW NEARCTIC *NEBRIA* SPECIES AND SUBSPECIES

The order of presentation of new taxa in this section follows a new classification of Nearctic *Nebria* to be presented elsewhere (Kavanaugh, manuscript in preparation).

Nebria gouleti, new species

(Figures 2, 13, 51)

HOLOTYPE, a male, in CAS, labelled: "U.S., Wash., Asotin Co., Hwy. 129, 10 mi. sw. Antone, Rattlesnake Cr., 3000', 25 August 1973 DHKavanaugh Family"/"D. H. Kavanaugh Col-

lection" [orange label]/"Holotype *Nebria gouleti* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/"California Academy of Sciences Type No. 12504." ALLOTYPE (same data as holotype) also in CAS. In total, 514 PARATYPES (227 males and 288 females) are deposited in the following collections: AMNH, ANSP, BfCa, CAS, CUC, DHKa, DJLa, LRus, MCZ, MSU, OSUO, PURC, RTBe, SJSC, UASM, UIMI, UMMZ, USNM, UWBM, and WSU.

TYPE-LOCALITY.—Rattlesnake Creek (10 miles [ca. 16 km] sw of Antone), Asotin County, Washington.

DIAGNOSTIC COMBINATION.—Head uniformly dark, without pale spot(s) on vertex, antennal scape moderately long, symmetrically ellipsoid (Fig. 2); pronotum distinctly cordate, midlateral seta present (Fig. 13), without longitudinal tubercle medial to midlateral seta; elytra dull, microsculpture deeply impressed, meshes isodiametric or very slightly transverse, fifth elytral interval without setae; metepisternum impunctate; hind coxa bi- or trisetose basally, tarso-meres of hind tarsus glabrous dorsally; second visible abdominal sternum with patch of setae medially (between hind coxae), third to fifth visible sterna each with two to six pairs of posterior paramedial setae (Fig. 37).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this species in honor of my good friend and frequent field companion, Henri Goulet, from whom I have learned to observe and appreciate carabid beetles while they are still alive!

GEOGRAPHICAL DISTRIBUTION.—Figure 51: restricted to portions of the Columbia Plateau region in Washington, Oregon, and Idaho; the lower Columbia River valley; and the mountains of northern and central Idaho. I have studied specimens from the following localities.

United States of America

IDAHO: Adams County, New Meadows ([1,170 m]) [June] (1; UIMI); Bonner County, Sandpoint [Sep.] (1; CAS); Clearwater County, Canyon Ranger Station [Sep.] (1; UIMI); Custer County, Lower Stanley (10 miles [ca. 16 km] E on Salmon River [1,800 m]) [Aug.] (1; DHKa), Salmon River (at Bayhorse Creek [1,620 m]) [Aug.] (45; DHKa); Idaho County, Fenn Ranger Station (Selway Fork Clearwater River) [Aug.] (3; UIMI), Lochsa River (at Canyon Creek [520 m]) [July] (2; DHKa), Lowell (39 miles [ca. 63 km] NE on Lochsa River [850 m]) [July] (1; DHKa), Meadow Creek (1.5 miles [ca. 2.4 km] S of Selway Falls) [Sep.] (1; CAS), Orogrande Creek [Aug.] (3; UWBM), Selway Falls [July] (1; UWBM); Kootenai County, Coeur d'Alene [June–July] (5; CAS, MCZ, USNM), Hayden Lake [Aug.] (9; AMNH, MCZ, UIMI, USNM); Latah County, Kendrick [Sep.] (2; UIMI), Moscow (1; USNM); Lemhi County, Salmon (and 21 miles [ca. 34 km] N) [July–Aug.] (2; UASM, UIMI); Nez Perce County, Lenore [May] (2; UIMI), Lewiston (and 2 and 3 miles [ca. 3.2 and 4.8 km]

E on Clearwater River [300 m–380 m] [May–Aug., Oct.] (52; DHKa, UIMI), Waha [Aug.] (5; CAS, MCZ, PURC, USNM), Waha Lake [July] (4; CAS, MCZ); Shoshone County, Avery [Sep.] (2; UWBM), Clarkia [June] (1; UIMI), St. Joe River (17 miles [ca. 27 km] E of St. Maries) [July] (10; CAS); Valley County, Dagger Falls [July] (2; BFCa); Zena Creek [June] (1; UIMI); County unknown, Bungalow [Aug.] (15; UWBM). OREGON: Baker County, East Fork Eagle Creek [July] (2; UWBM), Halfway [July] (1; BFCa); Hood River County, Hood River [Sep.] (2; MCZ); Multnomah County, Portland [July] (3; CUIC); Umatilla County, Cottonwood Creek [June] (3; USNM, UWBM), Kamela [June] (1; CAS), Milton (Walla Walla River) [May–June] (4; UWBM), s of Kooskooskie (Washington) [June] (2; UWBM); Union County, Elgin (and 0.1 mile [0.16 km] s at Grande Ronde River [1,130 m]) [May, Aug.] (2; DHKa), Hilgard Junction State Park [Aug.] (3; RTBe), La Grande (1 mile [ca. 1.6 km] NE on Grande Ronde River [1,070 m]) [May] (5; DHKa), Wallowa County, Minam (0.2 miles [ca. 0.3 km] SE at junction of Minam and Wallowa rivers [790 m]) [May] (5; DHKa). WASHINGTON: Asotin County, Antone (10 miles [ca. 16 km] SW at Rattlesnake Creek [910 m]) [Aug.] (21; DHKa), Asotin (Asotin Creek [370 m]) [May–June] (18; ANSP, CAS, DHKa), Buford Creek (3.6 miles [ca. 5.8 km] s of Grande Ronde River [760 m]) [May] (8; DHKa), Grande Ronde River (at Highway 129 [550 m]) [May, Sep.] (2; DHKa, SJSC); Chelan County, Leavenworth [July] (20; ANSP, CAS, MCZ, PURC, USNM, UWBM), Peshastin Creek [July] (1; UASM), Tumwater Canyon ([610 m]) [May] (2; LRus); Columbia County, Dayton (Touchet River [580 m]) [May, July] (5; DHKa, WSU); Franklin County, Palouse Falls State Park [May] (2; LRus); Klickitat County, Trout Lake [July] (1; UWBM), White Salmon [Aug.] (2; UWBM); Skamania County, Underwood (15 miles [ca. 24 km] W on Columbia River [90 m]) [May] (4; DHKa); Spokane County, Spokane Falls (1; CAS); Walla Walla County, Burbank [May] (1; ANSP), Coppei [May] (1; UAFA), Coppei Creek [May] (1; UIMI), Kooskooskie [June, Aug.] (33; UIMI, UWBM), Touchet River (near Waitsburg) [July] (98; DJLa), Walla Walla (and 2 miles [ca. 3.2 km] s [320 m], Mill Creek) [May–Sep.] (139; CAS, CUIC, DHKa, MCZ, OSUO, PURC, UIMI, UMMZ, UWBM, WSU); Whitman County, Almota [May] (2; MCZ, MSU), Wawawai (2.8 miles [ca. 4.5 km] NW at Snake River [300 m]) [May] (11; DHKa), Wilma [Apr.–May] (6; ANSP, UWBM).

Doubtful Records

CANADA—ALBERTA: Longview (Highwood River) [July] (7; CAS). UNITED STATES OF AMERICA—CALIFORNIA: (2; USNM).

Nebria lacustris bellorum, new subspecies

(Figures 14, 52)

Nebria lacustris; BELL 1955:265 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S., Tenn., Great Smoky Mts. N. P., Chimneys Picnic Area, W. Prong Little Pigeon R., 3000', 24May73 DHKavanaugh & HGoulet"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria lacustris bellorum* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12506." ALLOTYPE (same data as holotype) also in CAS. In total, 276 PARATYPES (139 males and 137 females) are deposited in the following collections: CAS, CUIC, DHKa, HoKn, MCZ, RTBe, TCBA, UAFA, UASM, USNM.

TYPE-LOCALITY.—West Prong Little Pigeon River (at Chimneys Picnic Area), Great Smoky Mountains National Park, Tennessee.

DIAGNOSTIC COMBINATION.—Head uniformly dark, without pale spot(s) on vertex; pronotum (Fig. 14) distinctly cordate, midlateral seta present, without longitudinal tubercle medial to midlateral seta; elytra very shiny or faintly iridescent, microsculpture consists of thin, transverse lines without (or with only scattered) meshes, striae very deeply impressed, intervals markedly convex, fifth interval without setae; metepisternum impunctate; tarsomeres of hind tarsus glabrous dorsally; second visible abdominal sternum glabrous medially, third to fifth visible sterna each with single pair of posterior paramedial setae; specimen from locality in southeastern United States, south of French Broad River (North Carolina or Tennessee) (Fig. 52).

DERIVATION OF TAXON NAME.—I take pleasure in naming this subspecies in honor of Ross and Joyce Bell (Burlington, Vermont), who have long been interested in the *Nebria* of eastern North America, and who have generously provided encouragement and information for this study.

GEOGRAPHICAL DISTRIBUTION.—Figure 52; restricted to that portion of the southern Appalachian region including Great Smoky Mountains National Park and adjacent mountain ranges. I have studied specimens from the following localities.

United States of America

NORTH CAROLINA: Great Smoky Mountains National Park [June] (1; MCZ), Indian Gap [Sep.] (1; USNM), Kephart Prong Oconaluftee River [Aug.] (14; DHKa, TCBA), Newfound Gap ([1,520 m–1,580 m]) [Aug.] (1; MCZ), Oconaluftee River (11 miles [ca. 18 km] SE of Newfound Gap on Highway 441 [550 m], at Smokemont [840 m] and 2.3 miles [ca. 3.7 km] NW of Smokemont [610 m]) [May, Sep.] (61; DHKa, USNM), Smokemont Loop Trail ([760 m–910 m]) [July] (18; UAFA); Haywood County, Beach Gap (7 miles [ca. 11 km] s of Sunburst at Middle Prong West Fork Pigeon River [1,520 m]) [June, Aug.] (4; HoKn), Bubbling Spring Branch ([1,520 m]) [July] (10; DHKa, TCBA), Graveyard Fields (Blue Ridge Parkway at Yellowstone Prong Pigeon River [1,540 m]) [May] (1; DHKa), Mount Sterling ([910 m]) [Oct.] (7; CAS, CUIC), Retreat [May] (6; USNM); Swain County, Bryson City (Deep Creek [610 m]) [Aug.] (2; MCZ). TENNESSEE: Great Smoky Mountains National Park, Alum Cave Creek ([1,220 m–1,250 m]) [May] (4; DHKa), Chimneys Camp ([910 m]) [May, Sep.] (18; CAS, CUIC, USNM), Newfound Gap ([1,520 m–1,580 m]) [Aug.] (2; MCZ, UASM), Tennessee Branch Bradley Creek ([980 m]) [May] (15; USNM), Walker Prong Little Pi-

geon River [Aug.] (1; DHKa), West Prong Little Pigeon River ([1,040 m–1,220 m]), Chimneys Picnic Area [910 m], (3 miles [ca. 4.8 km] s of Gatlinburg [520 m], 3.7 miles [ca. 6.0 km] N of Newfound Gap [1,220 m]) [May, July, Sep.] (109; DHKa, MCZ, UAFA, USNM); Sevier County, Gatlinburg [June] (1; DHKa).

Doubtful Records

UNITED STATES OF AMERICA—COLORADO: Jefferson County, Golden (Clear Creek) [June] (1; USNM). LOUISIANA: St. Tammany Parish, Highway 90 (10 miles [ca. 16 km] w of Mississippi border) [June] (1; CAS).

Nebria nivalis gaspesiana, new subspecies

(Figures 15, 53)

Nebria suturalis; LENG (not LeConte). —LENG 1920:47 (in part). —LINDROTH 1955a:39.

Nebria nivalis bifaria MANNERHEIM. —LINDROTH 1955a:39 (in part).

Nebria nivalis; *auctorum*. —LAROCHELLE 1972:62 (in part); 1976:48; 1977:12 (in part). —LINDROTH 1961:81 (in part); 1971:1459.

Nebria bifaria; LINDROTH 1961:81 (in part).

HOLOTYPE, a male, in CAS, labelled: "Can., Que., Peninsule de Gaspé, Mt. Albert, Ruisseau du Diable, 3200'–3500', 11–12 June 73 DHKavanaugh & HGoulet"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria nivalis gaspesiana* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12510." ALLOTYPE (same data as holotype) also in CAS. In total, 287 PARATYPES (119 males and 168 females) are deposited in the following collections: ALar, CAS, CNC, DBUM, DHKa, MCZ, RTBe, UASM, USNM.

TYPE-LOCALITY.—Ruisseau du Diable (980 m–1,070 m), Mont Albert, Parc de La Gaspésie, Comté de Gaspé-Ouest, Québec.

DIAGNOSTIC COMBINATION.—Head uniformly dark, without pale spot(s) on vertex; pronotum (Fig. 15) distinctly cordate, midlateral seta present, with small longitudinal tubercle medial to midlateral seta; fifth elytral interval with one to four setae; metepisternum impunctate; tarsomeres of hind tarsus glabrous dorsally; specimen from locality in Maine (Mount Katahdin), Gaspé Peninsula, Island of Newfoundland, or Labrador (west only to east shore of Ungava Bay) (Fig. 53).

DERIVATION OF TAXON NAME.—This subspecies is named for the Gaspé Peninsula, on which the type-locality is found.

GEOGRAPHICAL DISTRIBUTION.—Figure 53; disjunct; restricted to the western part of the Island of Newfoundland, Mount Katahdin (Maine), the high mountains of the Gaspé Peninsula, and coastal Labrador (northwest to the eastern shore of Ungava Bay). I have studied specimens from the following localities.

Canada

NEWFOUNDLAND: Island of Newfoundland, Little Codroy River [July] (4; MCZ, USNM), St. John Bay (Doctors Brook) [July] (5; CNC, ZMLS), South Branch (Grand Codroy River) [July] (4; MCZ), Spruce Brook (1; MCZ). QUÉBEC: Comté de Bonaventure [July] (1; ALar); Comté de Gaspé-Ouest, Parc de La Gaspésie (Mont Albert at Ruisseau du Diable [980 m–1,070 m]) [June–July] (261; ALar, CNC, DBUM, DHKa, RTBe); Territoire du Nouveau-Québec, Rivière Abloviak [July] (1; DBUM).

United States of America

MAINE: Piscataquis County, Baxter State Park (Mount Katahdin [910 m–1,580 m]) [June–Aug.] (10; CAS, MCZ, USNM).

Nebria gyllenhali lassenensis, new subspecies

(Figures 3, 54)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Calif., Lassen Volcanic N. P., Cascade Range, s. slope Mt. Lassen, Emerald Lk., 2450m, 22Aug.74 D.H.Kavanaugh Coll."/"D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria gyllenhali lassenensis* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12511." ALLOTYPE (same data as holotype) also in CAS. In total, 34 PARATYPES (18 males and 16 females) are deposited in the following collections: CAS, DHKa, FMNH, USNM.

TYPE-LOCALITY.—Emerald Lake, Mount Lassen (south slope), Lassen Volcanic National Park, California.

DIAGNOSTIC COMBINATION.—Head, pronotum, and elytra without metallic reflection; head uniformly dark, without pale spot(s) on vertex, moderate in size and convexity, with genae and occiput not broadened, eyes full-sized; antennal scape (Fig. 3) short, straight, symmetrically ovoid or anteriorly more convex; penultimate labial palpomere trisetose; pronotum small, slightly narrow, moderately cordate (lateral margin moderately arcuate at middle), slightly dull to moderately shiny, microsculpture moderately to faintly impressed, meshes isodiametric, alveolae flat, midlateral seta present, without longitudinal tubercle medial to midlateral seta; elytral intervals flat, third interval continuous or faintly catenate (setiferous pores slightly to moderately foveate), fifth interval without setae; hindwing full-sized; metepisternum impunctate; tarsomeres of hind tarsus glabrous dorsally; second visible abdominal sternum glabrous medially, third to fifth visible sterna each with single pair of posterior paramedial setae; specimen from locality in northern Sierra Nevada (California) or Cascade Range south of Columbia River (Fig. 54).

DERIVATION OF TAXON NAME.—This subspe-

cies is named for Mount Lassen, on the south slope of which the type-locality is found.

GEOGRAPHICAL DISTRIBUTION.—Figure 54: restricted to the southern Cascade Range (south of the lower Columbia River valley) and the northern Sierra Nevada (south to Sonora Pass). I have studied specimens from the following localities.

United States of America

CALIFORNIA: Lassen Volcanic National Park, Emerald Lake (2,450 m) [Aug., Oct.] (6; CAS, DHKa, FMNH), Little Hot Springs Area (East Sulphur Creek [2,440 m–2,530 m]) [Aug.] (6; CAS, DHKa), Mount Lassen (3 miles [ca. 4.8 km] SE) [July] (1; USNM), Ridge Lake [Aug.] (16; CAS); Tuolumne County, Sonora Pass [Aug.] (3; CAS). OREGON: Deschutes County, Todd Lake (and 1 mile [ca. 1.6 km] S) [Aug.] (4; JSch).

Nebria gyllenhali lindrothi, new subspecies

(Figures 4, 54)

Nebria sahlbergi; WICKHAM 1902:232.

Nebria gyllenhali; auctorum. —ARMIN 1963:90.

HOLOTYPE, a male, in CAS, labelled: "U.S., Wyo., Albany Co., Medicine Bow Mts., Snowy Range, Brooklyn Lk. 10500', 11July72 DHKavanaugh"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria gyllenhali lindrothi* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12512." **ALLOTYPE** (same data as holotype) also in CAS. In total, 1579 **PARATYPES** (795 males and 784 females) are deposited in the following collections: AMNH, ANSP, CArm, CAS, CDA, CNC, CUB, CUIC, DHKa, DRWh, EAMa, FMNH, ICCM, KSUC, MCZ, MSU, PADA, PMCh, PMNH, PURC, RCGr, RDav, RTBe, SDSU, UAFA, UASM, USNM, UWBM, UWL, ZMLS.

TYPE-LOCALITY.—Brooklyn Lake (3,200 m), Albany County, Wyoming.

NOTES ON NOMENCLATURE AND TYPES.—This subspecies is the form noted by Lindroth (1969b:1109) as an undescribed species related to *N. gyllenhali*.

DIAGNOSTIC COMBINATION.—Head, pronotum, and elytra without metallic reflection; head uniformly dark, without pale spot(s) on vertex, moderate in size and convexity, with genae and occiput not broadened, eyes full-sized; antennal scape (Fig. 4) long, straight, slightly arcuate, moderately or markedly narrowed basally; penultimate labial palpomere trisetose; pronotum small, slightly narrow, moderately cordate (lateral margin moderately arcuate at middle), slightly dull to moderately shiny, microsculpture moderately to faintly impressed, meshes isodiametric, alveolae flat, midlateral seta present, without longitudinal tubercle medial to midlat-

eral seta; elytral intervals flat, third interval continuous or faintly catenate (setiferous pores slightly to moderately foveate), fifth interval without setae; hindwing reduced in size and venation pattern; metepisternum impunctate; tarsomeres of hind tarsus glabrous dorsally; second visible abdominal sternum glabrous medially, third to fifth visible sterna each with single pair of posterior paramedial setae; specimen from locality in southern Rocky Mountains—in Medicine Bow Mountains or Sierra Madre (Wyoming), or Uinta Mountains (Utah), or further south (Fig. 54).

DERIVATION OF TAXON NAME.—I am honored to name this subspecies after Carl H. Lindroth, a friend whose knowledge of and studies on Holarctic Carabidae, and *Nebria* in particular, have been a guiding light in this study, and who first called my attention to the distinctiveness of members of this taxon. I deeply regret that Carl did not live to see the completion of this study, to which he contributed so much.

GEOGRAPHICAL DISTRIBUTION.—Figure 54: restricted to the southern Rocky Mountains, from northern New Mexico north to the Medicine Bow Mountains and Sierra Madre of southern Wyoming, west to the Uinta Mountains of eastern Utah. I have studied specimens from the following localities.

United States of America

COLORADO: (2; KUSM, PURC); Boulder County, ([3,810 m]) [July] (1; CUB), Arapaho Pass ([2,740 m–3,350 m]) [Aug.] (1; RTBe), Arapaho Peak ([3,510 m]) [Aug.] (3; CArm), Beaver Creek ([2,530 m]) [July] (1; CArm), Fourth of July Mines ([3,430 m]) [Aug.] (2; CArm), Jenny Lake ([3,200 m]) [July] (2; CArm), Middle St. Vrain Creek ([3,600 m]) [July] (1; CArm), Niwot Ridge ([3,050 m]) [July] (5; CArm, CUB), Rainbow Lakes ([3,350 m]) [Aug.] (3; CNC), Rollins Pass ([3,410 m–3,540 m]) [Aug.] (2; CUB, DHKa), South Fork Middle Boulder Creek ([2,900 m–3,960 m]) [Aug.] (1; CArm); Clear Creek County, Leavenworth Valley (Argentine Road [3,660 m–3,960 m]) (2; USNM), Loveland Pass ([3,660 m–3,840 m]) [July] (42; CAS, RTBe, UWBM), Mount Evans ([3,600 m–4,330 m]), Summit Lake [3,900 m–3,960 m]) [July–Aug.] (76; CAS, CNC, DHKa, FMNH, MCZ, PURC, RCGr, UASM); Conejos County, Cumbres Pass ([3,050 m]) [June] (1; CAS); Custer County, Ophir Creek (7.3 miles [ca. 11.7 km] sw of Fairview [3,140 m]) [June] (9; DHKa), St. Charles River (1.9 miles [ca. 3.1 km] sw of San Isabel [2,710 m–2,830 m]) [June] (14; DHKa), Wet Mountains ([3,470 m]) [July] (2; USNM); Dolores County, Lizard Head Pass ([3,050 m]) [Sep.] (1; CAS), Rico area ([2,590 m–3,050 m]) [July] (10; ANSP, MCZ, USNM); El Paso County, Pikes Peak ([3,960 m]) [July] (8; AMNH, CAS), South Cheyenne Creek (at Gold Camp Road [2,530 m–2,650 m]) [June] (1; DHKa); Garfield County, Trappers Lake ([2,530 m–2,650 m]) [June] (49; DHKa); Gilpin

County, Central City ([2,620 m] [July] (1; CAS), Corona ([3,350 m] [Sep.] (7; CAS, CUIC), South Boulder Creek (at Rollinsville and 2.5 miles [ca. 4.0 km] w [2,440 m] [July–Aug.] (5; CArm, DHKa, UAFA); Grand County, Ptarmigan Peak (20; MCZ, ZMLS); Gunnison County, Gothic ([2,930 m] [July] (2; USNM), Mexican Cut Lakes (1 mile [ca. 1.6 km] nw of Elko Park [3,440 m] [Aug.] (1; PMNH); Huerfano County, Apishapa Pass [June] (3; CUB), Bear Lake [June] (13; DHKa, EAMa), Blue Lake [June] (10; DHKa, EAMa), Cucharas Pass ([3,050 m] and 1.5 miles [ca. 2.4 km] n) [June] (109; DHKa, EAMa), Ducharas River (near Blue Lake [3,190 m] [June] (5; DHKa); Jackson County, Cameron Pass ([3,140 m] [Aug.] (1; UASM), Rabbit Ears Pass ([2,740 m] [June–Aug.] (8; CAS, USNM); La Plata County, Hermosa Creek Trail (nw of Hermosa [2,960 m] [Aug.] (9; UASM); Larimer County, Browns Lake Trail [Aug.] (9; RTBe), Crown Point [July] (21; RTBe), Zimmerman Lake [Aug.] (3; RTBe); Los Animas County, Apishapa Pass (2.1 miles [ca. 3.4 km] se [3,230 m] [June] (9; DHKa), Bear Creek (5 miles [ca. 8 km] s of Cucharas Pass [2,800 m] [June] (83; DHKa); Mesa County [Aug.] (5; PMCh, RDav), Grand Mesa ([3,050 m] [July–Aug.] (6; CAS, CUB, USNM), Skyway ([3,050 m] [June] (2; DHKa, FMNH); Mineral County, Pagosa Springs (20 miles [ca. 32 km] n) [June] (1; DRWh), Wolf Creek Pass ([3,250 m–3,660 m] and 2 miles [ca. 3.2 km] w, Thunder Mountain [3,570 m] [June–Aug.] (96; CAS, CDA, CNC, DHKa, EAMa, UASM, USNM); Ouray County, American Flats ([3,660 m] [July] (4; AMNH), Ouray area [June–July] (4; AMNH, CAS); Park County, Middle Fork North Platte River (near Hoosier Pass [3,540 m] [July] (1; DHKa), Mount Lincoln ([3,350 m] [Aug.] (1; UASM); Rio Grande County, Rio Grande River (1 mile [ca. 1.6 km] s of South Fork [2,400 m] [Aug.] (29; DHKa, EAMa), Summitville ([3,050 m–3,350 m] [Aug.] (7; CNC, MCZ); Rocky Mountain National Park ([3,200 m–3,510 m] [June–Aug.] (11; CAS, CNC, UASM), Fall River Pass ([3,600 m] [July] (5; CUB), Longs Peak ([3,840 m], Chasm Lake [3,810 m] [July–Aug.] (14; CArm), Milner Pass ([3,280 m] [July] (1; AMNH), Ouzel Falls ([3,050 m] [Aug.] (1; CArm), Sandbeach Lake ([3,050 m] [June] (7; CArm), Trail Ridge Road ([3,660 m–3,960 m] [Aug.] (2; CUB, USNM); Routt County, Buffalo Pass (Summit Lake [3,140 m] (4; CAS), Walton Creek (above Dumont Lake [2,900 m–2,960 m] [Aug.] (5; DHKa); San Juan County, Silverton ([3,660 m] [July] (1; USNM); Summit County, Quandary Peak (south slope [3,410 m–3,960 m] [Aug.] (35; DHKa); Teller County ([3,410 m] [June] (1; PADA), Phantom Canyon ([2,960 m] [June] (1; CAS); County unknown, “Hot Springs” (1; ICCM), “King’s Lake” ([3,350 m] [Aug.] (2; CArm), La Plata Mountains ([3,200 m–3,660 m] [July–Aug.] (4; DHKa, USNM), “Laramie Co.” (2; ICCM), Medicine Bow Range ([2,440 m–3,660 m] [July] (3; MCZ), Mount Baldy (summit [3,750 m] [July] (1; CArm), San Juan Mountains ([3,660 m] [July] (1; USNM), “foothills of Rocky Mts.” (1; PMNH). NEW MEXICO: (9; ANSP, ICCM, KUSM, MCZ, USNM); Mora County, Pecos Baldy (2; AMNH); Rio Arriba County, Gregorio Lake ([2,790 m] [June] (5; DHKa), Rio Puerco (at Rio Puerco Campground [2,350 m–2,440 m] [June] (3; DHKa); San Miguel County, Beaver Creek (sw of Rincon Montoso [2,620 m] [Aug.] (15; UASM), Cowles area ([2,440 m], Spirit Lake Trail) [June] (4; AMNH, UASM), Las Vegas area ([2,130 m] [July] (1; KUSM), Willow Creek (near Torrero [2,740 m] [June] (8; UASM); Santa Fe County, Lake Katherine ([3,600 m] [June] (30; DHKa), Lake Peak (5; AMNH), Nambe Divide ([3,350 m] [July] (2; ANSP), Santa Fe Ski Basin (5 miles [ca. 8 km]

nw) (1; AMNH); Taos County, Red River (2.2 miles [ca. 3.5 km] [2,610 m], 4.1 miles [ca. 6.6 km] [2,580 m], and 5 miles [ca. 8 km] w of Red River, 8 miles [ca. 13 km] s of Red River [2,870 m] [June] (40; AMNH, DHKa), Tres Ritos [July] (4; CAS), Wheeler Peak ([3,050 m–3,640 m], nw slope, Middle Fork Lake [3,340 m], Middle Fork Red River [3,260 m–3,690 m] [June] (172; AMNH, DHKa). UTAH: Duchesne County, Garfield Basin (stream below Tungsten Lake [3,450 m] [Sep.] (3; USNM); Grand County, Mill Creek (at Oowah Lake [2,680 m] [Aug.] (12; DHKa); San Juan County ([2,800 m] [Aug.] (1; FMNH), Dark Canyon ([2,960 m], ne slope [3,240 m] [Aug.] (30; UASM), Geyser Pass ([3,050 m], n slope [3,120 m], e slope [3,220 m], at Blue Lake [2,960 m] [July–Aug.] (79; AMNH, UASM), Mill Creek Valley ([2,900 m] [Aug.] (2; UASM). WYOMING: Albany County, Brooklyn Lake ([3,200 m] [July] (41; DHKa), Centennial area ([3,050 m] [Aug.] (22; MSU, SDSU), Douglas Creek (1 mile [ca. 1.6 km] sse of Keystone [2,680 m] [July] (32; DHKa), Little Brooklyn Lake ([3,120 m] [July] (113; DHKa), Medicine Bow Peak ([3,350 m–3,660 m] [July–Aug.] (3; FMNH, KSUC, UWL), Mirror Lake ([3,290 m] [July] (37; USNM), Nash Fork Little Laramie River (7.5 miles [ca. 12.1 km] nw of Centennial [2,990 m] [July] (1; DHKa), Snowy Range Pass ([3,200 m] [June, Aug.] (33; RTBe, UASM); Carbon County, Elk Mountain (35.0 miles [ca. 56.3 km] ne of Saratoga [3,400 m] [July] (32; USNM), Hidden Treasure Gulch (11.5 miles [ca. 18.5 km] wsw of Encampment [2,870 m] [July] (2; DHKa), Lake Marie ([3,230 m] and 8 miles [ca. 13 km] sw [2,740 m] [July] (7; DHKa), North French Creek (4 miles [ca. 6.4 km] w of Mirror Lake [3,050 m] [July] (3; DHKa), Silver Lake ([3,170 m] [July] (32; USNM).

Doubtful Records

UNITED STATES OF AMERICA—MASSACHUSETTS: (1; UMRM).

Nebria acuta quileute, new subspecies

(Figures 16, 38, 46, 55)

Nebria acuta LINDROTH 1961:71 (in part).

HOLOTYPE, a male, in CAS, labelled: “U.S., Wash., Olympic N. P., Olympic Mts., Boulder Cr. at Olympic Hot Springs, 2000’. 20July71 DHKavanaugh & EAMartinko”/ “D. H. Kavanaugh Collection” [orange label]/ “Holotype *Nebria acuta quileute* Kavanaugh det. D. H. Kavanaugh 1976” [red label]/ “California Academy of Sciences Type No. 12494.” ALLOTYPE (same data as holotype) also in CAS. In total, 135 PARATYPES (81 males and 54 females) are deposited in the following collections: CAS, CNC, DHKa, LACM, MCZ, UASM, UIMI, USNM, UWBM.

TYPE-LOCALITY.—Boulder Creek (at Olympic Hot Springs), Olympic National Park, Washington.

DIAGNOSTIC COMBINATION.—Pronotum (Fig. 16) moderately cordate, basal sinuation of lateral margin moderately short and deep, basal angle rectangular or slightly acute, midlateral seta absent; elytra slightly shiny, microsculpture moderately impressed, meshes isodiametric (broken) or slightly transverse, elytral silhouette subrectangular, not narrowed basally, humeral angle not rounded or obtuse, humeral carina markedly

developed and projected anterolaterally; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with apex of median lobe as in Figure 38; female without anterodorsal sclerite in bursa copulatrix (Fig. 46); specimen from locality on Olympic Peninsula, Washington (Fig. 55).

DERIVATION OF TAXON NAME.—This subspecies is named for the people native to the area including the type-locality, the Quileute tribe.

GEOGRAPHICAL DISTRIBUTION.—Figure 55: restricted to the Olympic Peninsula, Washington. I have studied specimens from the following localities.

United States of America

WASHINGTON: Olympic National Park [Aug.] (5; LACM, MCZ), Dosewallips River (at Mascott Campground) [July] (10; UWBM), Eagle Point ([1,830 m]) [July] (1; CNC), Olympic Hot Springs (Boulder Creek [610 m–780 m]) [May–Aug.] (120; CAS, CNC, DHKa, UIMI, USNM, UWBM), Sol Duc Hot Springs [June] (1; CAS).

***Nebria sahlbergii modoc*, new subspecies**

(Figures 17, 56)

HOLOTYPE, a male, in CAS, labelled: "U.S., Calif., Modoc Co., Warner Mts., 4 mi. e. New Pine Creek, Pine Cr., 5700', 22May71 DHKavanaugh & EAMartinko"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria sahlbergii modoc* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12513." **ALLOTYPE** (same data as holotype) also in CAS. In total, 15 **PARATYPES** (10 males and 5 females) are deposited in the following collections: CAS, DHKa, UASM, USNM.

TYPE-LOCALITY.—Pine Creek (4 miles [ca. 6.4 km] E of New Pine Creek), Modoc County, California.

DIAGNOSTIC COMBINATION.—Pronotum (Fig. 17) size moderate, basal sinuation of lateral margin long and deep, basal angles rectangular, not denticulate, lateral explanation broad throughout its length, midlateral seta absent; proepisternum faintly punctulate anteriorly; elytra slightly short and narrowed basally, elytral silhouette subrectangular, humeral angle not markedly rounded or obtuse, humeral carina moderately developed, slightly projected anterolaterally; specimen from locality in Warner Mountains (northeastern California or southcentral Oregon) (Fig. 56).

DERIVATION OF TAXON NAME.—This subspecies is named for the county in which the type-locality is found, as well as for the people native to the region, the Modoc tribe.

GEOGRAPHICAL DISTRIBUTION.—Figure 56:

restricted to the Warner Mountains of northeastern California and southcentral Oregon. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Modoc County, Cedar Pass [June] (6; USNM), New Pine Creek (4 miles [ca. 6.4 km] E at Pine Creek [1,740 m]) [May] (11; DHKa).

***Nebria sahlbergii triad*, new subspecies**

(Figures 18, 56)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Calif., Trinity Co., Trinity Alps, S. F. Salmon R. at Big Flat Campgd., 1490m, 18July75 D.H. & B.A. Kavanaugh Stop #75-36"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria sahlbergii triad* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12514." **ALLOTYPE** (same data as holotype) also in CAS. In total, 212 **PARATYPES** (98 males and 114 females) are deposited in the following collections: CAS, DHKa, FMNH, MCZ, PUCA, UASM, USNM.

TYPE-LOCALITY.—South Fork Salmon River (at Big Flat Campground), Trinity County, California.

DIAGNOSTIC COMBINATION.—Pronotum (Fig. 18) large, broad, basal sinuation of lateral margin moderate in length and depth, basal angles rectangular, not denticulate, lateral explanation broad throughout its length, midlateral seta absent; proepisternum smooth anteriorly; elytra moderate in length and basal width, elytral silhouette subrectangular, humeral angle not markedly rounded or obtuse, humeral carina moderately developed, slightly projected anterolaterally; specimen from locality in Klamath Mountains system of the Coast Ranges (northwestern California or southwestern Oregon) (Fig. 56).

DERIVATION OF TAXON NAME.—This subspecies is named for the Trinity Alps, in which the type-locality is found. I use a synonym of 'trinity' for this purpose.

GEOGRAPHICAL DISTRIBUTION.—Figure 56: restricted to the Klamath Mountains system of northwestern California, probably also in southwestern Oregon. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Siskiyou County, Gulick Creek (at road to Josephine Lake [1,550 m]) [Aug.] (1; CAS); Trinity County, Boulder Creek (at Goldfield Campground [1,070 m]) [July] (56; CAS, DHKa), Coffee Creek (at Coffee Creek Ranch [1,070 m]) [July] (32; CAS, DHKa), Morris Meadows ([1,340 m]) [Aug.] (1; PUCA), South Fork Salmon River (at Big Flat Campground [1,490 m]) [June–Aug.] (124; CAS, DHKa, FMNH, MCZ, UASM, USNM).

***Nebria lituyae*, new species**

(Figures 29, 57)

HOLOTYPE, a male, in CAS, labelled: "4 June 1977 3356' under stones, summit Mt. Blunt, 2 mi. s. Lituya Bay, SE Alaska D. Mann coll. 102"/ "Holotype *Nebria lituyae* Kavanaugh det. D. H. Kavanaugh 1979" [red label]/ "California Academy of Sciences Type No. 13460." **ALLOTYPE** (same data as holotype) also in CAS. In total, 21 **PARATYPES** (11 males and 10 females) are deposited in the following collections: CAS, DHKa, DMan, UASM, USNM.

TYPE-LOCALITY.—Mt. Blunt, 2 miles [ca. 3.2 km] s of Lituya Bay, Alaska.

DIAGNOSTIC COMBINATION.—Head width moderate or slightly broadened, eyes moderately convex, each epilobe of mentum with apical tooth short or moderately long; pronotum with lateral explanation broad throughout its length, basal angles rectangular, basal sinuation of lateral margin moderate in length and depth, mid-lateral seta absent; prosternal intercoxal process (Fig. 29) lanceolate, completely margined (even at apex); elytra slightly elongate, narrow, with or without faint metallic violet reflection, elytral silhouette subovoid, slightly to moderately narrowed basally, humeral angle not markedly rounded or obtuse, humeral carina slightly developed and projected anterolaterally; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; specimen from locality in southeastern Alaska (mainland) (Fig. 57).

DERIVATION OF TAXON NAME.—This species is named for Lituya Bay, near which the type-locality is found.

GEOGRAPHICAL DISTRIBUTION.—Figure 57; known only from southeastern Alaska, near Lituya Bay. I have studied specimens from the following locality.

United States of America

ALASKA: Mount Blunt (2 miles [ca. 3.2 km] s of Lituya Bay [720 m–760 m]) [June] (23; CAS, DHKa, DMan, UASM, USNM).

***Nebria arkansana edwardsi*, new subspecies**

(Figures 30, 33, 39, 47, 58)

Nebria sahlbergi; *auctorum*.—EDWARDS 1975:48. —MANK 1934:74.

Nebria arkansana; LINDROTH 1961:70 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S., Mont., Glacier N. P., Livingston Range, Logan Pass Area, ne. slope Mt. Clements, 7100', 17July72 DHKavanaugh & JGEwards"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria arkansana edwardsi* Kavanaugh det. D. H. Kavanaugh

1976" [red label]/ "California Academy of Sciences Type No. 12495." **ALLOTYPE** (same data as holotype) also in CAS. In total, 1872 **PARATYPES** (1060 males and 812 females) are deposited in the following collections: AMNH, ANSP, BFCa, CAS, CNC, CUIC, DBUM, DHKa, DJLa, FMNH, INHS, JSch, JVMA, KUSM, LRus, MCZ, MSU, OSUO, PMNH, PURC, ROM, RTBe, SJSC, UAFA, UASM, UBC, UIMI, USNM, UWBM.

TYPE-LOCALITY.—Logan Pass, Glacier National Park, Montana.

NOTES ON NOMENCLATURE AND TYPES.—

Lindroth (1961:70) designated the valley of the Upper San Juan River, Archuleta County, Colorado, as type-locality for *N. arkansana* Casey. As a result, the nominal subspecies of *N. arkansana* is one restricted to the southern Rocky Mountains (southcentral Wyoming and further south). The name presented here is for the widely distributed subspecies left unnamed by Lindroth's choice of type-locality.

DIAGNOSTIC COMBINATION.—Head moderate in size and relative width; pronotum with lateral explanation broad throughout its length, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately deep, mid-lateral seta absent; elytra slightly to moderately dull, microsculpture with meshes isodiametric or slightly transverse, elytral silhouette rectangular or subrectangular, broad basally, basal margination (Fig. 30) straight or slightly concave, merged smoothly with lateral margination, humeral angle not markedly rounded or obtuse, humeral carina absent or very slightly developed; hindwing with full reflexed apex distal to stigma (Fig. 33); hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with median lobe (Fig. 39) broad, with apex short and narrow; female with posterodorsal sclerite of bursa copulatrix as in Figure 47; specimen from locality in Rocky Mountain region, but only north or west of Utah and southern Wyoming (Fig. 58).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this subspecies in honor of J. Gordon Edwards, whose keen interest in life at high altitude has fostered my own.

GEOGRAPHICAL DISTRIBUTION.—Figure 58; widespread, distributed in Rocky Mountain region from southern Yukon Territory south to northeastern Nevada, Idaho, and northern Wyoming. I have studied specimens from the following localities.

Canada

ALBERTA: Banff National Park, Banff [Aug.–Sep.] (3; CUIIC, UASM), Boom Lake ([1,830 m]) [July] (1; CNC), Bow Lake [Aug.] (1; UASM), Bow River ([1,830 m]) [Aug.] (6; CNC), Johnson Creek Trail (at Johnson Creek Campground) [July] (1; ROM), Lake Agnes [Aug.] (1; PMNH), Lake Louise [June–Sep.] (16; AMNH, CAS, CNC, MCZ, UBC), Ptarmigan Mountain ([2,590 m]) [Aug.] (13; CNC), Spray Lake [July] (1; JVMa), Sunset Pass ([1,950 m]) [Aug.] (4; CNC), Jasper National Park [Aug.] (2; AMNH), Amethyst Lake (and Amethyst Lake Trail [1,710 m]) [July] (10; DHKa, UASM), Angel Glacier [Sep.] (1; RTBe), Hardisty Creek (1 mile [ca. 1.6 km] s on Highway 93) [July] (1; RFre), Jasper [Aug.] (3; USNM), Miette Hot Springs [Aug.] (1; RTBe), Miette River (at Meadow Creek [1,100 m]) [July–Aug.] (22; DHKa, UASM), Mount Edith Cavell ([1,360 m] and below Angel Glacier) [July] (3; DHKa, UAFa), Portal Creek Trail ([1,950 m]) [July] (3; USNM), Waterton Lakes National Park [July–Aug.] (5; UASM, UWBM), Cameron Lake (creek below lake) [July] (7; USNM), Red Rock Canyon [July] (2; CAS), Waterton Park (Cameron Creek) [July] (36; CNC, MCZ, UASM); Other localities, Bellevue (2 miles [ca. 3.2 km] w at Gold Creek [1,370 m]) [July] (1; DHKa), Blackstone Gap [Aug.] (2; CNC), Blairmore (1; USNM), Blakiston Brook [July] (10; UASM), Carbondale River (near Lost Creek) [Sep.] (1; DJLa), Cline River (at Highway 11) [Aug.] (2; DHKa), Gap [Aug.] (1; CAS), Gorge Creek [July] (2; UASM), Happy Valley (Pincher Creek) [Aug.] (11; CAS, UASM), Highwood Pass ([2,380 m]) [July] (15; CNC), Highwood River [Aug.] (1; CAS), Marmot Creek (10 miles [ca. 16 km] sw of Kananaskis Forest Experiment Station [1,520 m]) [Aug.] (10; CNC), Mill Creek Ranger Station [Aug.] (2; CAS), Pincher Creek ([1,620 m]) [July] (3; DJLa), Ram River area [July] (2; BFCa), Sheep River (4.5 miles [ca. 7.2 km] above Gorge Creek) [Aug.] (7; DHKa), West Branch Castle River ([1,340 m]) [Aug.] (6; DJLa). BRITISH COLUMBIA: Glacier National Park, Asulkan Glacier area [Aug.] (1; CNC), Glacier [July–Aug.] (6; CAS, CNC, PURC), Rogers Pass ([1,370 m]) [Aug.] (2; ANSP, CAS), Kootenay National Park [Aug.] (3; CNC), Kimpton Creek ([1,220 m]) [July] (2; CNC), Kindersley Pass ([2,130 m]) [July] (4; CNC), Kootenay River (at Highway 1B) [Aug.] (1; UASM), Marble Canyon [July] (1; CNC), Sinclair Creek ([1,830 m] and at Highway 13) [June–Aug.] (25; CAS, CNC, UASM, UBC), Vermillion Creek [July] (4; CAS, MSU, UBC), Yoho National Park [July] (3; CAS), Amiskwi River (and at Amiskwi Falls [1,830 m]) [Aug.] (34; CNC), Field (and 3 miles [ca. 4.8 km] e on Kicking Horse River) [June, Aug.] (4; CAS, USNM), Lake Oesa ([2,130 m]) [July] (18; CNC), Lake O'Hara [July] (10; CAS, CNC, UBC), Otterhead River ([1,680 m]) [Aug.–Sep.] (29; CNC, DHKa), Yoho River ([1,400 m], 4 to 12 miles [ca. 6.4 to ca. 19 km] e of Field, at Takakkaw Falls [1,520 m]) [July–Aug.] (25; CNC, DHKa, UASM); Other localities, Boswell [Aug.] (1; UASM), Cabin Creek (NE of Fernie, near Michel) [July] (13; CNC, UASM), Creston (8 miles [ca. 13 km] w) [June] (3; CNC), Crowsnest Pass (2 miles [ca. 3.2 km] w [1,280 m] and 5 miles [ca. 8 km] w on Elk River [1,220 m]) [July] (51; DHKa), Edgewood [July–Aug.] (3; CAS), Elk Creek (E of Fernie) [July] (4; UASM), Elk River (10.7 miles [ca. 17.2 km] w of Fernie) [July] (3; ROM), Erickson (Arrow Creek) [Aug.] (12; CAS, UBC), Fernie (Coal Creek [1,680 m], Fairy Creek, Lizard Creek) [July–Aug.] (63; BFCa, CAS, CNC, DBUM, FMNH, MSU, UBC), Flathead [June] (1; CUIIC), Fort Steele [June, Sep.] (2; CAS, UBC), Fortysixmile Camp (at Hope Trail) [July] (4; CAS, CNC, UBC), Hope

Mountains [July–Sep.] (6; CNC, INHS, MCZ), Hosmer (Elk River) [July] (1; CAS), Lorna [June] (2; CAS, UBC), Manning Provincial Park (Nicomen Ridge) [July] (10; CAS, CNC, MSU, UBC), Michel (5; UASM), Mount Copeland ([1,980 m]) [Aug.] (21; CNC), Radium Hot Springs [Aug.] (6; CAS, CNC, UBC), Slocan [Aug.] (2; BFCa), South Fork Creek [Aug.] (1; UWBM), Summit Creek (near Creston) [Aug.] (5; UASM), Tetsa River (Alaska Highway mile 378 and mile 390) [Aug.] (3; DHKa, MSU), Vernon [July] (1; CAS), Whipsaw Creek (at Hope Trail [1,460 m]) [July] (1; UBC), Wyndel [Sep.] (1; CNC), YUKON TERRITORY: Rancheria (Swift River) [Aug.] (6; CNC, UASM).

United States of America

IDAHO: Blaine County, Alturas Lake (at Alturas Inlet Campground [2,130 m]) [Aug.] (11; DHKa), Cherry Creek (0.1 miles [ca. 0.2 km] NW of Highway 93 [2,230 m]) [Aug.] (6; DHKa), Dollarhide Summit (2 miles [ca. 3.2 km] E at North Fork Warm Springs Creek [2,350 m–2,410 m]) [Aug.] (9; DHKa), Galena [July] (1; BFCa), Galena Summit (2.4 miles [ca. 3.9 km] NE [2,320 m]) [Aug.] (12; DHKa), Hyndman Creek [July] (22; UWBM), Ketchum (2 miles [ca. 3.2 km] NNW at Big Wood Creek [1,830 m]) [Aug.] (28; DHKa), North Fork Warm Springs Creek (10 miles [ca. 16 km] w of Ketchum [1,890 m]) [Aug.] (92; DHKa), Sun Valley [Sep.] (2; JSch); Camas County, Carrie Creek (32 miles [ca. 51 km] [2,440 m] and 36 miles [ca. 58 km] [2,100 m] ESE of Ketchum) [Aug.] (106; DHKa), South Fork Boise River (14 miles [ca. 23 km] E of Featherville at Skeleton Creek [1,550 m], 34 miles [ca. 55 km] E of Featherville at Bear Creek [1,830 m]) [Aug.] (157; DHKa); Cassia County, Rock Creek (15 miles [ca. 24 km] S of Hansen, at Rock Creek Ranger Station) [June–July] (6; UIM); Custer County, Bayhorse Creek (7 miles [ca. 11 km] NW of Highway 93 [2,440 m]) [Aug.] (3; DHKa), Fourth of July Creek (3 miles [ca. 4.8 km] E of Highway 93 [2,230 m]) [Aug.] (58; DHKa), Stanley [July] (1; UWBM), Trail Creek Summit (2 miles [ca. 3.2 km] NE at Summit Creek [2,320 m]) [Aug.] (9; DHKa); Fremont County, Island Park [July] (3; BFCa); Shoshone County, Avery (7 miles [ca. 11 km] E) [July] (1; UIM); Valley County, Dagger Falls [July] (2; BFCa), Middle Fork Salmon River (near Boundary Creek) [Aug.] (7; RTBe); County unknown, Twin Creek Forest Camp ([1,520 m]) [July] (57; UWBM). MONTANA: Carbon County, Quad Creek (17 miles [ca. 27 km] SW of Red Lodge [3,050 m]) [July] (66; DHKa); Fergus County, East Fork Rock Creek ([1,710 m]) [July] (42; DHKa); Flathead County, Marias Pass (10 miles [ca. 16 km] W of summit [1,370 m]) [July] (11; LRus), South Fork Flathead River (at Hungry Horse Reservoir [1,220 m]) [July] (3; LRus); Gallatin County, Fairy Lakes [Aug.] (1; CUIIC); Glacier National Park [July–Aug.] (6; CUIIC), Baring Creek (at St. Mary Lake) [Aug.] (3; UWBM), Grinnel Falls ([1,860 m]) [Aug.] (1; SJSC), Grinnel Glacier ([1,860 m–1,890 m]) [Aug.] (21; DHKa, SJSC, USNM), Grinnel Lake (at inlet [1,540 m]) [Aug.] (1; DHKa), Lake McDonald (and at Sprague Creek Campground) [July–Aug.] (4; CAS, RTBe), Lake Sherburne (at Canyon Creek) [July] (1; CAS), Logan Pass ([2,030 m–2,130 m] and 5 miles [ca. 8 km] W [1,770 m]) [July–Sep.] (16; DHKa, JSch, RTBe, UASM), Morning Eagle Falls ([1,680 m]) [July] (1; SJSC), Mount Clements (NE slope [2,160 m]) [July] (5; DHKa), Piegan Pass ([2,410 m]) [Aug.] (1; SJSC), St. Mary [Aug.] (8; SJSC, UASM); Madison County, Beaver Creek ([1,920 m]) [Aug.] (1; KUSM), Ennis [July] (2; UIM); Mineral County, Haugan [Aug.] (14; KUSM), Lookout Pass ([1,280 m]) [July] (1; LRus), Saltese [July, Sep.] (3; MSU,

SJSC): Sweetgrass County, Big Timber Creek (at Half Moon Campground [2,230 m–2,290 m]) [July] (1; DHKa). NEVADA: Elko County, Lamoille Creek (at Lower Lamoille Campground [1,920 m]) [Aug.] (35; DHKa). Thomas Creek (at Thomas Creek Campground [2,320 m–2,380 m]) [Aug.] (130; DHKa). OREGON: Baker County, Cornucopia [June–July] (35; DHKa, UWBM); Union County, Elgin (and 9 miles [ca. 14 km] NW at Little Phillips Creek [1,300 m]) [May, Aug.] (6; DHKa). Langdon Lake area (SE of summit) [Aug.] (2; UWBM). Tollgate-Elgin Road [June] (3; UWBM); Wallowa County [Aug.] (1; JSch). Aneroid Lake ([2,320 m]) [July] (2; FMNH). East Fork Eagle Creek [July] (9; UWBM). Indian Crossing (Imnaha River) [Aug.] (2; MSU, OSUO). Lostine River ([1,310 m], at French Campground, at Two Pan Campground [1,710 m–1,980 m]) [Aug.] (112; DHKa, USNM, UWBM). Lost Lake [Aug.] (1; UWBM). Wallowa Lake [July–Aug.] (10; DHKa, UWBM). Wallowa River (above inlet to Wallowa Lake) [May] (1; DHKa). WASHINGTON: Walla Walla County, Walla Walla [Aug.] (1; UWBM). WYOMING: Big Horn County, Granite Pass (8 miles [ca. 13 km] SW on Granite Creek [2,380 m]) [July] (5; DHKa). Shell Creek (11 miles [ca. 18 km] SW of Granite Pass [2,130 m]) [July] (14; DHKa). West Tensleep Creek ([3,140 m–3,200 m]) [July] (17; DHKa). Johnson County, Clear Creek (12 miles [ca. 19 km] W of Buffalo [2,190 m]) [July] (1; DHKa). South Fork Clear Creek (16 miles [ca. 26 km] W of Buffalo [2,350 m], at South Fork Campground [2,350 m]) [July–Aug.] (6; DHKa, FMNH); Park County, Fox Creek (at Highway 212) [Aug.] (1; CAS); Sheridan County, Little Tongue River (13 miles [ca. 21 km] WSW of Dayton [2,380 m]) [July] (22; DHKa). Washakie County, Tensleep (6 miles [ca. 10 km] [1,550 m] and 11 miles [ca. 18 km] [1,890 m] NE on Tensleep Creek) [July] (4; DHKa); Yellowstone National Park [Aug.] (25; USNM); County unknown, Bighorn Reserve (1; MCZ).

Nebria arkansana oowah, new subspecies

(Figures 40, 48, 58)

HOLOTYPE, a male, in CAS, labelled: "U.S., Utah, Grand Co., LaSal Mts., Mill Cr. at Oowah Lk., 8800', 2Aug71 DHKavanaugh & EAMartinko"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria arkansana oowah* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12496." ALLOTYPE (same data as holotype) also in CAS. In total, 75 PARATYPES (54 males and 21 females) are deposited in the following collections: CAS, DHKa, MCZ, UASM, USNM.

TYPE-LOCALITY.—Mill Creek (at Oowah Lake), Grand County, Utah.

DIAGNOSTIC COMBINATION.—Head moderate in size and relative width; pronotum with lateral explanation broad throughout its length, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately deep, mid-lateral seta absent; elytra with humeral angle not markedly rounded or obtuse, humeral carina moderately developed, elytral silhouette subrectangular, broad basally, hindwing full-sized; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with

median lobe broad, apex as in Figure 40; female with posterodorsal sclerite of bursa copulatrix as in Figure 48; specimen from locality in La Sal Mountains (eastern Utah) (Fig. 58).

DERIVATION OF TAXON NAME.—This subspecies is named for the small, sheltered lake at the type-locality.

GEOGRAPHICAL DISTRIBUTION.—Figure 58; restricted to the La Sal Mountains of eastern Utah. I have studied specimens from the following localities.

United States of America

UTAH: Grand County, Mill Creek (at Oowah Lake [2,680 m]) [Aug.] (74; CAS, DHKa, MCZ, USNM); San Juan County, Mill Creek Valley ([2,900 m]) [Aug.] (3; UASM).

Nebria arkansana uinta, new subspecies

(Figures 35, 41, 58)

HOLOTYPE, a male, in CAS, labelled: "U.S., Utah, Summit Co., Uinta Mts., Hwy. 150, Lost Lk., 9800', 14Aug71 DHKavanaugh"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria arkansana uinta* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12497." ALLOTYPE (same data as holotype) also in CAS. In total, 93 PARATYPES (44 males and 49 females) are deposited in the following collections: CAS, DHKa, MCZ, UASM, USNM.

TYPE-LOCALITY.—Lost Lake, Summit County, Utah.

DIAGNOSTIC COMBINATION.—Head moderate in size and relative width; pronotum with lateral explanation broad throughout its length, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately deep, mid-lateral seta absent; elytra with humeral angle not markedly rounded or obtuse, humeral carina moderately developed; elytral silhouette subrectangular or subovoid, slightly narrowed basally; hindwing reduced in length and width (Fig. 35); hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with median lobe as in Figure 41; specimen from locality in Uinta Mountains or in Wasatch Mountains at or north of Weber River, Utah (Fig. 58).

DERIVATION OF TAXON NAME.—This subspecies is named for the Uinta Mountains, in which the type-locality is found.

GEOGRAPHICAL DISTRIBUTION.—Figure 58; restricted to the Uinta Mountains and the Wasatch Mountains at or north of Weber River (northern Utah). I have studied specimens from the following localities.

United States of America

UTAH: Cache County, Logan River (13.7 miles [ca. 22 km] E of Logan at Cottonwood Creek [1,740 m]) [Aug.] (65; CAS, DHKa, MCZ, UASM); Duchesne County, Painter Basin (3,470 m) [Sep.] (1; USNM); Summit County, Lost Lake (2,990 m) [Aug.] (7; DHKa), Upper Provo River (20.8 miles [ca. 33 km] E of Kamas [2,600 m], at Highway 150) [Aug.] (6; DHKa, USNM); Uintah County, Big Brush Creek (7 miles [ca. 11 km] WNW of Highway 44 [2,620 m]) [Aug.] (14; DHKa); Weber County, Ogden (6 miles [ca. 10 km] E on Ogden River [1,490 m]) [Aug.] (2; DHKa).

***Nebria fragilis* teewinot, new subspecies**

(Figures 35, 42, 59)

HOLOTYPE, a male, in CAS, labelled: "U.S., Wyo., Teton N. P., Teton Mts., Mt. Teewinot, stream on se. slope, 7100'-9000', 3Aug.73 DHKavanaugh Family"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria fragilis* teewinot Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12500." ALLOTYPE (same data as holotype) also in CAS. In total, 377 PARATYPES (219 males and 158 females) are deposited in the following collections: CAS, DHKa, KUSM, MCZ, SJSC, UASM, USNM.

TYPE-LOCALITY.—Mount Teewinot (southeast slope), Grand Teton National Park, Wyoming.

DIAGNOSTIC COMBINATION.—Head moderate in size and relative width; pronotum with lateral explanation broad throughout its length, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately deep, mid-lateral seta absent; elytra slightly shiny, micro-sculpture faintly impressed, with meshes irregularly isodiametric or slightly transverse, with or without faint metallic green or violet reflection, elytral silhouette subrectangular or sub-ovoid, slightly narrowed basally, humeral angle not markedly rounded or obtuse, humeral carina moderately developed; hindwing reduced in length and width (Fig. 35); hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with median lobe as in Figure 42; specimen from locality in westcentral Wyoming (Fig. 59).

DERIVATION OF TAXON NAME.—This subspecies is named for the type-locality.

GEOGRAPHICAL DISTRIBUTION.—Figure 59; restricted to mountain ranges of the Rocky Mountain system in westcentral Wyoming. I have studied specimens from the following localities.

United States of America

WYOMING: Grand Teton National Park, Mica Lake ([2,970 m]) [July] (1; DHKa), Mount Teewinot (se. slope [2,160 m–2,740 m]) [Aug.] (79; DHKa), South Fork Cascade Canyon

(3,080 m) [July] (1; SJSC), South Fork Garnet Canyon (2,820 m) [July] (1; SJSC), Timberline Lake area [July] (1; DHKa); Lincoln County, White Creek (20 miles [ca. 32 km] SE of Alpine Junction [1,950 m–2,190 m]) [Aug.] (40; DHKa), Wolf Creek (16.1 miles [ca. 26 km] SW of Hoback Junction [1,770 m–1,780 m]) [July–Aug.] (137; CAS, DHKa, MCZ, UASM, USNM); Sublette County, Green River Lakes (west shores [2,440 m–2,590 m]) [July] (53; DHKa), Hoback River (14 miles [ca. 23 km] SW of Highway 187/189 [2,440 m]) [July] (11; DHKa); Teton County, Alaska Basin (near Sunset Lake [2,940 m]) [July] (1; SJSC), Granite Creek (at Granite Falls [2,160 m]) [July] (37; DHKa), Togwotee Pass ([2,960 m] and 3.7 miles [ca. 6.0 km] WNW at Blackrock Creek [2,770 m]) [Aug.] (20; DHKa, KUSM).

***Nebria zioni* oasis, new subspecies**

(Figures 5, 60)

HOLOTYPE, a male, in CAS, labelled: "U.S., Utah, Washington Co., Pine Valley Mts., Leeds Cr. at Oak Grove Campgd., 6300'–6500', 20June71 DHKavanaugh & EAMartin-ko"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria zioni* oasis Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12518." ALLOTYPE (same data as holotype) also in CAS. In total, 46 PARATYPES (18 males and 28 females) are deposited in the following collections: CAS, DHKa, UASM, USNM.

TYPE-LOCALITY.—Leeds Creek at Oak Grove Campground, Washington County, Utah.

DIAGNOSTIC COMBINATION.—Body and appendages dark (piceus or black); antennal scape (Fig. 5) medium length, straight, almost cylindrical (slightly narrowed basally); each epilobe of mentum with tooth moderately long; pronotum with lateral explanation moderately broad throughout its length, basal angles rectangular or slightly acute and projected posteriorly, lateral margin without subapical sinuation but with basal sinuation moderately long and deep, mid-lateral seta absent; elytra not vaulted, slightly flattened, elytral silhouette ovoid, markedly narrowed basally, humeral angle markedly rounded and obtuse, humeral carina markedly developed, fifth and seventh elytral intervals without setiferous pores; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; specimen from locality in Pine Valley Mountains (Utah) (Fig. 60).

DERIVATION OF TAXON NAME.—This species is named for the oasislike nature of the type-locality—a spot of green, as it were, in an otherwise dry land.

GEOGRAPHICAL DISTRIBUTION.—Figure 60; restricted to the Pine Valley Mountains of southwestern Utah. I have studied specimens from the following locality.

United States of America

UTAH: Washington County, Leeds Creek (at Oak Grove Campground [1,920 m–1,980 m]) [June] (46; CAS, DHKa, UASM, USNM).

Nebria obliqua chuskae, new subspecies

(Figures 19, 34, 61)

HOLOTYPE, a male, in CAS, labelled: "USA Arizona Apache Co., sw. Red Rock Chuska Mts. Wagon Wheel Camp Gr. aspen-fir forest 2260m. Loc. 11 July 11–12, 1976"/ "SOUTHWESTERN USA EXP.—1976 G.E. Ball, J.M. Campbell, P.M. Hammond"/ "Holotype *Nebria obliqua chuskae* Kavanaugh det. D. H. Kavanaugh 1979" [red label]/ "California Academy of Sciences Type No. 13461." ALLOTYPE (same data as holotype) also in CAS. In total, 16 PARATYPES (10 males and 6 females) are deposited in the following collections: CAS, MCZ, UASM, USNM.

TYPE-LOCALITY.—Lukachukai Creek (at Wagon Wheel Campground), Apache County, Arizona.

DIAGNOSTIC COMBINATION.—Mandible markedly explanate laterally, broad; tooth of mentum bifid, with notch V-shaped; pronotum (Fig. 19) relatively long and narrow, moderately cordate, moderately narrowed basally, widest anterior to middle, slightly shiny (microsculpture faintly or moderately impressed, meshes isodiametric), basal margin not or only slightly sinuate laterally, lateral bead narrow, obliterated basally in most specimens, basal foveae broad, smooth or faintly rugulose or punctulate, basal angles obtuse, basal sinuation of lateral margin absent, lateral explanation moderately wide and more broadened posteriorly only, mid-lateral seta absent; elytral silhouette subovoid, slightly narrowed basally, lateral margins slightly rounded; hindwing (Fig. 34) reduced in length; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; specimen from locality in Chuska Mountains, Arizona (Fig. 61).

DERIVATION OF TAXON NAME.—This subspecies is named for the Chuska Mountains, in which the type-locality is found.

GEOGRAPHICAL DISTRIBUTION.—Figure 61; restricted to the Chuska Mountains, Arizona. I have studied specimens from the following locality.

United States of America

ARIZONA: Apache County, Lukachukai Creek (at Wagon Wheel Campground [2,260 m–2,320 m]) [July–Aug.] (18; CAS, MCZ, UASM, USNM).

Nebria darlingtoni, new species

(Figures 20, 62)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Calif., El

Dorado Co., Sierra Nevada, S. F. American River., 3 mi. w. of Riverton, 910m, 16 July 75 D. H. & B.A. Kavanaugh Stop #75-29"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria darlingtoni* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12499." ALLOTYPE (same data as holotype) also in CAS. In total, 170 PARATYPES (105 males and 65 females) are deposited in the following collections: AMNH, CAS, DHKa, ICCM, KSUC, KUSM, MCZ, UASM, USNM.

TYPE-LOCALITY.—South Fork American River (3 miles [ca. 4.8 km] w of Riverton), El Dorado County, California.

DIAGNOSTIC COMBINATION.—Body black, legs dark brown or piceus; microsculpture on pronotum and elytra very deeply impressed, meshes isodiametric, alveolae convex; pronotum (Fig. 20) with lateral explanation narrow at middle, broadened posteriorly, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately short and deep, mid-lateral seta absent; elytra with humeral carina slightly developed, slightly projected anteriorly, elytral silhouette ovoid, markedly narrowed basally, humeral angles moderately rounded and obtuse; hind coxa bi- or plurisetose basally; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; specimen from Sierra Nevada, California (Fig. 62).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this species in honor of Philip J. Darlington, Jr., biogeographer, student of carabid evolution, and friend, whose work and personal encouragement have provided inspiration in this study.

GEOGRAPHICAL DISTRIBUTION.—Figure 62; apparently restricted to the canyon of the South Fork of the American River, Sierra Nevada, California. I have studied specimens from the following localities.

United States of America

CALIFORNIA: El Dorado County [Aug.] (9; CAS, ICCM, KSUC, MCZ, USNM), Kyburz (2 miles [ca. 3.2 km] E on South Fork American River [1,340 m]) [July] (5; CAS, DHKa), Pacific House [Sep.] (5; CAS), Riverton (South Fork American River [980 m], 3 miles [ca. 4.8 km] w at Bridal Falls Picnic Area [910 m]) [July–Aug.] (151; AMNH, CAS, DHKa, KUSM, MCZ, UASM), White Hall [June] (2; UASM).

Nebria navajo, new species

(Figures 43, 63)

HOLOTYPE, a male, in CAS, labelled: "Kayenta Ariz. 19 mi. sw VI-18-33"/ "Navajo Co. Alt. 6500 ft."/"Ansel F Hall Exp. 1933"/ "Holotype *Nebria navajo* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12509." One male PARATYPE (same data as holotype) also in CAS.

TYPE-LOCALITY.—Kayenta (19 miles [ca. 31 km] sw, Navajo County, Arizona,

DIAGNOSTIC COMBINATION.—Body pale tan-orange, legs pale yellow; microsculpture on pronotum and elytra moderately impressed, meshes isodiametric, alveolae flat; pronotum with lateral explanation narrow at middle, broadened posteriorly, basal angles rectangular or slightly acute, basal sinuation of lateral margin moderately short and deep, midlateral seta absent; elytra with humeral carina slightly developed, slightly projected anteriorly, elytral silhouette ovoid, markedly narrowed basally, humeral angles moderately rounded and obtuse; hindwing short, narrow; hind coxa bi- or plurisetose basally; apex of fourth tarsomere of hind tarsus with ventrolateral lobe long; third to fifth visible abdominal sterna each with two or more pairs of posterior paramedial setae; male with apex of median lobe as in Figure 43; specimen from Arizona (Fig. 63).

DERIVATION OF TAXON NAME.—This species is named for the people native to the region including the type-locality.

GEOGRAPHICAL DISTRIBUTION.—Figure 63; known only from the type-locality in northeastern Arizona. I have studied specimens from the following locality.

United States of America

ARIZONA: Navajo County, Kayenta (19 miles [ca. 31 km] sw [1,980 m]) [June] (2; CAS).

Nebria gebleri cascadiensis, new subspecies

(Figures 21, 64)

Nebria gebleri; *auctorum*. —HATCH 1939:118 (in part).

—LINDROTH 1961:83 (in part). —VAN DYKE 1925:119 (in part); 1926:10 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S., Wash., Mt. Rainier N. P., Paradise R. above Narada Falls, 4580'–4800', 8Aug72 DHKavanaugh & HGoulet"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria gebleri cascadiensis* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12502." **ALLOTYPE** (same data as holotype) also in CAS. In total, 1696 **PARATYPES** (944 males and 752 females) are deposited in the following collections: AMNH, ANSP, BFCa, CAS, CNC, CUIC, DHKa, DJLa, FMNH, INHS, JSch, KSUC, KUSM, LRus, MCZ, MSU, NMDa, ODA, OSUC, OSUO, PURC, ROM, RTBe, SDSU, SJSC, UAFA, UASM, UBC, UCR, UIMI, UMMZ, USNM, UWBM, UWEM, WSU.

TYPE-LOCALITY.—Paradise River (above Narada Falls), Mount Rainier National Park, Washington.

DIAGNOSTIC COMBINATION.—Head moderate in size, dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 21) markedly cordate, with or without faint violet metallic reflection, sinuation of lateral margin very deep, midlateral

seta present, basolateral seta present; elytra moderately convex, with distinct violet or brassy metallic reflection, elytral silhouette sub-ovoid, slightly narrowed basally, basal margination moderately concave, humeral angle roundly obtuse, humeral carina moderately to markedly developed, fifth elytral interval without setae (in few individuals with one to three setae), not (or in few individuals moderately) catenate, striae moderately impressed; specimen from locality in Cascade Range of central Oregon to southern British Columbia (Fig. 64).

DERIVATION OF TAXON NAME.—This subspecies is named for the Cascade Mountain Range, in which members of this taxon are widely distributed.

GEOGRAPHICAL DISTRIBUTION.—Figure 64; restricted to the Cascade Range (from central Oregon to southern British Columbia), the adjacent mountain ranges west of the Okanagan lowland in southwestern British Columbia, and to Vancouver Island (not yet recorded from the Olympic Peninsula, Washington, although I predict that it will be found to occur there). I have studied specimens from the following localities.

Canada

BRITISH COLUMBIA: Copper Mountain [Aug.] (4; UBC), Cultus Lake Provincial Park (Entrance Bay Campground) [June] (4; ROM), Garibaldi (Cheakamus River) [Sep.] (2; JSpe), Garibaldi Provincial Park (Diamond Head Trail [1,070 m]) [July] (3; CNC), Hope [June–July] (8; BFCa, INHS), Hunter Creek (at Restmore Lodge) [July] (3; CAS), Manning Provincial Park (Blackwell Peak [910 m], Lightning Lake, Nicomen Ridge, Skagit River) [May–Sep.] (35; CAS, CNC, DHKa, KUSM, MCZ, MSU, RTBe, UBC, UMMZ), Midway Valley (near Merritt) [Aug.] (1; INHS), Nicolum River (at Hope Trail) [July] (2; UBC), North Bend [July] (19; USNM), Skagit River (at Hope Trail [760 m]) [July] (3; UBC), Snass Creek (at Warburton Trail [760 m]) [July] (5; UBC), Spious Creek [May] (1; CAS), Vancouver area (2; ANSP), Whipsaw Creek (at Hope Trail [1,220 m]) [May, July] (4; UASM, UBC), Vancouver Island, Port Alberni (Robertson Creek Spawning Channel) [June] (1; ROM).

United States of America

OREGON: Clackamas County, Austin Hot Springs [July] (1; OSUO), Brightwood (Salmon River) [July] (8; DHKa), Mount Hood (s slope below Timberline Lodge [1,190 m]) [Aug.] (2; DHKa), Rhododendron ([490 m] and 1 mile [ca. 1.6 km] se at Zig Zag River [600 m]) [July–Aug.] (55; CAS, DHKa, SJSC, UWBM); Deschutes County, Elk Lake [July] (1; UWBM), Upper Deschutes River [May] (1; UWBM); Hood River County, Hood River [May, July] (8; CAS, USNM), Mount Hood (Cloud Cap, Hood River Meadows Ski Area [1,710 m], Sand Creek, Tillie Jane Creek, Umbrella Falls) [June–Sep.] (70; CAS, DHKa, MCZ, NMDa, ODA, UCR, UIMI, UWBM); Marion County, Detroit ([460 m] and 5 miles [ca. 8.0 km] s) [July–Aug.] (3; LRus, UWBM); Multnomah County, Horsetail Falls ([120 m]) [May–July] (87; DHKa, JSch, ODA, OSUO). WASHINGTON: (32; ANSP, CAS, INHS, MCZ, OSUC,

USNM); Chelan County, Fish Lake [July] (1; UWBm), Leavenworth [July] (8; ANSP, KUSM, MCZ, SDSU, USNM), Tumwater Canyon ([610 m] [May] (1; LRus); Cowlitz County, Ariel [May] (1; UWBm), Cougar [Sep.] (2; OSUO), Hoffstadt Creek (at Toutle River) [July] (2; MSU, OSUO), North Fork Toutle River (14 miles [ca. 23 km] E of Toutle [300 m] [Aug.] (33; CAS, DHKa), Toutle River [July] (11; UWBm); King County, Baring [July] (2; FMNH), Green River Gorge (Green River) [May, Aug.] (5; UWBm), Greenwater River (at Greenwater Campground) [June] (1; UWBm), North Bend [July] (17; CAS, CUIC, MCZ), Renton (Cedar River) [May] (1; UWBm), Skykomish [July, Sep.] (2; UASM, UWBm), Snoqualmie [June] (4; UIM), Stevens Pass (and 4 miles [ca. 6.4 km] W) [June, Aug.] (5; LRus, UASM), Wellington [July] (10; CAS, MCZ, USNM, UWBm), White River (5 miles [ca. 8 km] W of Greenwater [1,490 m], Slippery Creek) [July–Aug.] (42; DHKa, UWBm); Kittitas County, Blewett Pass (Niger Creek) [July] (2; USNM), Easton (22; CAS, INHS, MCZ, USNM), Snoqualmie Pass [July] (4; CAS), Teanaway Ridge ([910 m] [July] (10; LRus); Klickitat County, Klickitat Valley [July] (1; MCZ); Lewis County, Lake Creek (3 miles [ca. 4.8 km] NE of Packwood [370 m] [July] (5; DHKa), White Pass (and 1.5 miles [ca. 2.4 km] W at Millridge Creek [1,280 m] [June–July] (42; DHKa, SJSC, USNM); Mount Rainier National Park ([1,760 m–1,830 m] [June–Sep.] (30; ANSP, CAS, CUIC, KSUC, MCZ, OSUO, SJSC, UIM, UWBm), Bear Flat ([1,520 m–1,830 m] [July] (1; CAS), Carbon River [June] (4; UWBm), Cayuse Pass [1,400 m] [June] (4; USNM), Fish Creek (at West End Road) [June] (1; ROM), Fryingpan Creek ([1,160 m–1,190 m] [July–Aug.] (38; CNC, DHKa, SJSC), Horse Creek (near Longmire) [July] (15; CAS), Ipsut Creek Campground [Aug.] (1; OSUO), Kautz Creek (at Nisqually River) [Sep.] (2; UWBm), Longmire ([1,760 m] [June–Aug.] (25; CAS, SJSC, USNM), Narada Falls ([1,370 m–1,460 m] [July–Aug.] (118; DHKa, USNM, UWBm), Nisqually River (0.1 miles [ca. 0.2 km] above Paradise River [980 m], toe of Nisqually Glacier [1,220 m–1,520 m] [July–Aug.] (7; AMNH, CAS, CUIC, DHKa, MCZ), North Fork Puyallup River (below toe of Puyallup Glacier [1,100 m–1,650 m] [July–Aug.] (22; CNC, DHKa, USNM), Ohanapecosh [June, Aug.] (18; DJLa, LRus, SJSC, UIM, USNM), Paradise area (below Sluskin Falls, Paradise Park [1,220 m–1,830 m], Paradise River [1,400 m–1,680 m], Paradise Valley) [June–Sep.] (88; CAS, CUIC, DHKa, FMNH, MCZ, USNM, UWBm), St. Andrews Creek (at West End Road [1,160 m] [Aug.] (5; DHKa), Silver Creek [Aug.] (10; UWBm), Sluskin Falls [July] (8; UWBm), Stevens Creek ([1,190 m–1,220 m] [June–July] (4; DHKa, USNM), Sunbeam Falls ([1,220 m] [May] (1; CNC), Sunrise area [July] (2; LRus), Tahoma Creek ([910 m] [July] (1; USNM), West End Road [July] (1; CAS), White River ([1,190 m] and at White River Campground [1,520 m] [July–Aug.] (12; FMNH, SJSC, USNM, UWBm), Van Trump Creek (above Christine Falls [1,220 m–1,280 m] [July–Aug.] (62; DHKa, UWBm); Pierce County, Goat Creek (at Nisqually River [610 m] [July] (130; DHKa), Fairfax [Oct.] (1; FMNH), Poch Creek (at Carbon River) [Aug.] (5; UCB, UWBm), Tenas Creek (5 miles [ca. 8.0 km] E of Ashford [610 m] [July] (1; DHKa), White River (at Silver Springs Campground [790 m] [June, Aug.] (15; DHKa, USNM); Skamania County, Carson [Aug.] (6; UIM), Concil Lake (SE on Forest Road 123 [1,260 m] [Aug.] (4; UASM), Mount St. Helens (Maratta Creek) [July] (3; DHKa), North Fork Cipsus River [June] (14; UWBm), North Fork Toutle River (at Spirit Lake Lodge [940

m] [Aug.] (31; CAS, DHKa), Spirit Lake [July, Sep.] (3; DHKa, UWBm), Stabler [June] (1; OSUO), Wind River (8 miles [ca. 13 km] N of Carson [340 m] [May, July] (14; DHKa); Snohomish County, Darrington (Clear Creek Falls) [May] (5; UWBm), Glacier Peak [July–Aug.] (2; CAS, UWBm); Whatcom County, Glacier (North Fork Nooksack River) [July] (13; CAS, LRus), Lookout Creek (4 miles [ca. 6.4 km] E of Glacier [380 m] [Aug.] (18; CAS, DHKa), Mount Baker (Austin Pass [1,520 m], Bagley Creek [670 m], Razor Hone Creek [1,680 m] [July–Sep.] (125; CAS, DHKa, JSpe, LRus, UCR, UWBm), North Fork Nooksack River (4 miles [ca. 6.4 km] E of Glacier [380 m], Silver Fir Campground [610 m] [Aug.] (3; CAS, DHKa), Shuksan ([1,760 m] [Aug.] (3; LRus), Shuksan Creek [Aug.] (12; UWBm), Skagit River (at Newhalem) [July] (2; UWBm); Yakima County, American River (at Hell's Crossing [1,040 m] [July–Aug.] (17; DHKa, ICCM, KUSM, MCZ, UIM, UMMZ, UWBm), Bumping River (0.8 miles [ca. 1.3 km] SW of Highway 410 [1,010 m] [July–Sep.] (92; CAS, DHKa, ICCM, MCZ, MSU, PURC, UAFA, USNM, WSU), Dog Lake ([1,310 m] [July] (25; DHKa), Mount Adams (Bird Creek [910 m–2,440 m], Chaparral Creek [880 m], Klickitat River) [June–July, Sep.] (82; AMNH, ANSP, CAS, CUIC, FMNH, ICCM, MCZ, UASM, UIM, USNM, UWBm, WSU), Naches River [July] (2; USNM), Tampico [July] (1; USNM), Tieton Dam [Aug.] (2; AMNH, WSU), Wildcat Creek (at Tieton River [880 m] [July] (3; DHKa, OSUO), Yakima area (11; JSch, MCZ, USNM, WSU), Yakima Indian Reservation ([910 m] [July] (1; CAS).

Doubtful Records

UNITED STATES OF AMERICA—COLORADO: Leavenworth Valley (1; ANSP). WASHINGTON: Pullman (1; ICCM).

Specimens Without Locality Data: (4; CDA, MCZ, MSU, UWBm).

Nebria gebleri fragariae, new subspecies

(Figures 22, 44, 49, 64)

HOLOTYPE, a male, in CAS, labelled: "U.S., Ore., Grant Co., Blue Mts., Strawberry Cr., 5800' 28 May 1971, DHKavanaugh & EAMartinko" / "D. H. Kavanaugh Collection" [orange label] / "Holotype *Nebria gebleri fragariae* Kavanaugh det. D. H. Kavanaugh 1979" [red label] / "California Academy of Sciences Type No. 12501." ALLOTYPE (same data as holotype) also in CAS. In total, 27 PARATYPES (21 males and 6 females) are deposited in the following collections: CAS, DHKa, UASM, USNM.

TYPE-LOCALITY.—Strawberry Creek (1,770 m), Grant County, Oregon.

DIAGNOSTIC COMBINATION.—Size moderate, standardized body length male less than 10.5 mm, female less than 11.0 mm; head moderate in size, dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 22) moderately cordate, with or without faint green metallic reflection, midlateral seta present, basolateral seta present; elytra with distinct green metallic reflection, elytral silhouette subrectangular, broad basally; male with apex of median lobe as in Figure 44; female with anterodorsal sclerite in

bursa copulatrix (Fig. 49); specimen from locality in Strawberry Range, Blue Mountains, eastern Oregon (Fig. 64).

DERIVATION OF TAXON NAME.—This subspecies is named for the Strawberry Range of the Blue Mountains, in which the type-locality is found. The subspecific epithet is a form of the scientific name for the strawberry genus, *Fragaria* Linnaeus.

GEOGRAPHICAL DISTRIBUTION.—Figure 64; restricted to the Strawberry Range of the Blue Mountains of eastern Oregon. I have studied specimens from the following locality.

United States of America

OREGON: Grant County, Strawberry Creek ([1,770 m]) [May] (29; CAS, DHKa, UASM, USNM).

Nebria gebleri siskiyouensis, new subspecies

(Figures 23, 64)

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Calif., Trinity Co., Trinity Alps, S. F. Salmon R. at Big Flat Campgd., 1490m, 18July75 D. H. & B. A. Kavanaugh Stop #75-36"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria gebleri siskiyouensis* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12503." **ALLOTYPE** (same data as holotype) also in CAS. In total, 33 **PARATYPES** (19 males and 14 females) are deposited in the following collections: CAS, DHKa, FMNH, UASM, USNM.

TYPE-LOCALITY.—South Fork Salmon River (at Big Flat Campground), Trinity County, California.

DIAGNOSTIC COMBINATION.—Head dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 23) with apical angles moderately narrow, midlateral seta present, basolateral seta present; elytra without metallic reflection, elytral silhouette subovoid, relatively short and broad; hindwing full-sized; specimen from locality in Klamath Mountains system of Coast Ranges in northwestern California or southwestern Oregon (Fig. 64).

DERIVATION OF TAXON NAME.—This subspecies is named for the Siskiyou Mountains, in which members of this taxon were first collected.

GEOGRAPHICAL DISTRIBUTION.—Figure 64; restricted to the Klamath Mountains system of the Coast Ranges in northwestern California and southwestern Oregon. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Trinity County, Boulder Creek (at Goldfield Campground [1,070 m]) [July] (2; CAS, DHKa), South Fork

Salmon River (at Big Flat Campground [1,490 m]) [June–July] (30; CAS, DHKa, FMNH, UASM, USNM), Taylor Lake Road (branch of Taylor Creek [1,750 m]) [Aug.] (1; CAS). OREGON: Jackson County, Little Applegate River ([700 m]) [Aug.] (2; CAS, FMNH).

Nebria carri, new species

(Figures 10, 24, 65)

HOLOTYPE, a male, in CAS, labelled: "U.S., Ida., Blaine Co., Sawtooth Mts., Smoky Range, 2 mi. e. Dollarhide Summit, N. F. Warm Springs Creek, 7700'–7900', 21 Aug.73 DHKavanaugh Family"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria carri* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12498." **ALLOTYPE** (same data as holotype) also in CAS. In total, 152 **PARATYPES** (63 males and 89 females) are deposited in the following collections: BFCa, CAS, DHKa, FMNH, GASH, MCZ, UASM, USNM.

TYPE-LOCALITY.—Dollarhide Summit, Blaine County, Idaho.

DIAGNOSTIC COMBINATION.—Head dark, with a pair of pale paramedial spots on vertex; penultimate labial palpomere bisetose; mentum (Fig. 10) with M_3 setae absent; pronotum (Fig. 24) with midlateral seta present, basolateral seta absent; specimen from locality east of Columbia Basin (Fig. 65).

DERIVATION OF TAXON NAME.—I take pleasure in naming this species in honor of John and Betty Carr (Calgary, Alberta), who first collected specimens of same, and who have provided help and encouragement to me and to other students during our respective studies.

GEOGRAPHICAL DISTRIBUTION.—Figure 65; known at present only from ranges of the Sawtooth Mountains system and from the Seven Devils Mountains of southcentral and western Idaho, respectively. I have studied specimens from the following localities.

United States of America

IDAHO: Adams County, Towsley Springs (9 miles [ca. 14 km] NNE of Cuprum [2,070 m]) [July–Aug.] (4; BFCa, DHKa); Blaine County, Dollarhide Summit (1.0 to 2.0 miles [ca. 1.6 to 3.2 km] E on North Fork Warm Springs Creek [2,350 m–2,500 m]) [Aug.] (138; CAS, DHKa, MCZ, UASM, USNM), Twin Lakes Trail (w of Petit Lake) [July] (2; BFCa); Camas County, Carrie Creek (32 miles [ca. 51 km] wsw of Ketchum [2,400 m]) [Aug.] (9; DHKa); Elmore County, Trinity Lakes [Aug.] (1; GASH).

Nebria kincaidi balli, new subspecies

(Figures 11, 31, 65)

Nebria kincaidi: *auctororum*. —BLACKWELDER AND BLACKWELDER 1948:2 (in part). —ERWIN AND BALI 1972:85 (in part). —HATCH 1939:121 (in part). —LINDROTH 1961:88 (in part). —VAN DYKE 1919:8 (in part).

Nebria columbiana; *auctorum* (not Casey). —HATCH 1939:121 (in part). —VAN DYKE 1919:8 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S., Wash., Mt. Rainier N. P., Paradise R. above Narada Falls, 4580'–4800', 8Aug72 DHKavanaugh & HGolet"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria kincaidi balli* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12505." ALLOTYPE (same data as holotype) also in CAS. In total, 366 PARATYPES (185 males and 177 females) are deposited in the following collections: AMNH, CAS, CNC, CUIC, DHKa, FMNH, KUSM, LACM, LRus, MCZ, MSU, ODA, OSUO, SJSC, UASM, USNM, UWBM, WSU.

TYPE-LOCALITY.—Paradise River (above Narada Falls), Mount Rainier National Park, Washington.

DIAGNOSTIC COMBINATION.—Head dark, with a pair of pale paramedial spots on vertex; penultimate labial palpomere trisetose; mentum (Fig. 11) with M_3 setae present; pronotum with midlateral seta present, basolateral seta absent; elytra with basal margination (Fig. 31) moderately long, smooth or faintly wavy, slightly to moderately concave; specimen from Cascade Range of central Washington to northern Oregon (Fig. 65).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this subspecies in honor of George E. Ball, my mentor and friend.

GEOGRAPHICAL DISTRIBUTION.—Figure 65; restricted to the Cascade Range of central Washington and northern Oregon. Present known range extends from Mount Rainier (Washington) south to Mount Hood (Oregon). I have studied specimens from the following localities.

United States of America

OREGON: Hood River County, Mount Hood ([910–1,830 m], Cloud Cap Road at Tillie Jane Road, Hood River Meadows Ski Area [1,620 m–1,710 m], Tillie Jane Creek [1,830 m], Umbrella Falls) [June–Sep.] (67; AMNH, CAS, CUIC, DHKa, MCZ, MSU, ODA, USNM, UWBM, WSU). WASHINGTON: Mount Rainier National Park [July–Sep.] (4; CUIC, SJSC, WSU), Cayuse Pass ([1,400 m]) [June] (1; USNM), Frypan Creek ([1,160 m–1,190 m]) [July–Aug.] (2; CNC, DHKa), Indian Henry's ([1,370 m–1,520 m]) [July] (1; UASM), Louise Lake [July] (5; UASM), Mowich Lake [July] (4; OSUO, UWBM), Mystic Lake [July] (1; WSU), Nisqually River ([1,220 m]) [May] (4; CNC), Paradise area (above Narada Falls [1,520 m], Paradise Park [1,520 m–1,830 m], Paradise River [1,460 m–1,830 m]) [June–Aug.] (265; CAS, CNC, CUIC, DHKa, FMNH, KUSM, LRus, MCZ, OSUO, UASM, USNM, UWBM), Ricksecker Point [Sep.] (1; UWBM), Sluskin Falls [July] (1; UWBM), Snow Lake ([1,520 m]) [Aug.] (1; CNC), Spray Park ([1,980 m]) [Aug.] (1; LRus), Sunrise area [July] (2; CAS, LRus), Van Trump Creek (above Christine Falls [1,220 m–1,280 m]) [July] (7; DHKa), Van Trump Park ([1,830 m]) [Aug.] (1; CNC), West End Drive [July] (1; CAS), Pierce County, Coplay Lake [May] (1; UWBM); Ska-

mania County, Spirit Lake ([910 m–1,770 m]) [Aug.] (1; OSUO).

Doubtful Records

UNITED STATES OF AMERICA—OREGON: Deschutes County, Bend [July] (8; LACM).

Nebria spatulata sierrae, new subspecies

(Figures 6, 66)

Nebria spatulata; ERWIN AND BALL 1972:83 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Calif., Mono Co., Sierra Nevada Mts., ne. face White Mt., along stream in cirque above Big Horn Lake, 3290m–3480m, 21 July 74 D.H.Kavanaugh Collector"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria spatulata sierrae* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12516." ALLOTYPE (same data as holotype) also in CAS. In total, 58 PARATYPES (28 males and 30 females) are deposited in the following collections: CAS, DHKa, MCZ, RPPa, UASM, UCB, USNM.

TYPE-LOCALITY.—White Mountain (east slope, above Big Horn Lake), Mono County, California.

DIAGNOSTIC COMBINATION.—Size moderate; standardized body length male less than 12.0 mm, female less than 12.4 mm; head with a pair of pale paramedial spots (or pair fused to form a single median spot), genae and occiput not swollen, eyes moderate in size and convexity; antennal scape (Fig. 6) moderate in length, slightly arcuate, markedly narrowed basally; pronotum with midlateral seta present, basolateral seta present; elytra rufous or piceus, very dull, with microsculpture deeply impressed, meshes isodiametric, without metallic reflection, elytral silhouette markedly ovoid, narrowed basally; hindwing vestigial; specimen from locality on Eastern Divide or more northern portion of Sierra Nevada (Fig. 66).

DERIVATION OF TAXON NAME.—This subspecies is named for the Sierra Nevada, California, to which its geographical range is restricted.

GEOGRAPHICAL DISTRIBUTION.—Figure 66; restricted to the Eastern Divide of the Sierra Nevada in California; presently known from as far north as Sonora Pass (Tuolumne County) and as far south as Big Pine Creek (Inyo County). I have studied specimens from the following localities.

United States of America

CALIFORNIA: Inyo County, Big Pine Creek (at Finger Lake [3,290 m]) [Aug.] (4; CAS); Mono County, H. M. Hall Natural Area ([3,350 m]) [July–Sep.] (9; RPPa), Saddlebag Lake [Sep.] (3; CAS), White Mountain (NE slope in cirque above Big Horn Lake [3,290 m–3,480 m]) [July] (13; DHKa); Tuolumne County, Sonora Pass ([2,740 m–3,350 m]) [July] (3; UCB, USNM); Yosemite National Park, Maclure Creek Basin ([3,290 m–

3,350 m) [Sep.] (1; DHKa, Mount Lyell (3,350 m) [July–Aug.] (23; CAS, MCZ, UASM), Tioga Pass (3,050 m) [Aug.] (2; CAS).

Doubtful Records

UNITED STATES OF AMERICA—CALIFORNIA: San Bernardino County [July] (2; CAS).

Nebria meanyi lamarckensis, new subspecies

(Figures 25, 32, 67)

HOLOTYPE, a male, in CAS, labelled: "U.S., Calif., Inyo Co., Sierra Nevada, Lamarck Cr. above Upper Lamarck Lk., 10700'–11000' 6July71 DHKavanaugh & EAMartinko" / "D. H. Kavanaugh Collection" [orange label] / "Holotype *Nebria meanyi lamarckensis* Kavanaugh det. D. H. Kavanaugh 1976" [red label] / "California Academy of Sciences Type No. 12507." ALLOTYPE (same data as holotype) also in CAS. In total, 21 PARATYPES (6 males and 15 females) are deposited in the following collections: CAS, DHKa, UASM.

TYPE-LOCALITY.—Lamarck Creek (above Upper Lamarck Lake), Inyo County, California.

DIAGNOSTIC COMBINATION.—Size moderate, standardized body length male less than 12.0 mm, female 9.5 to 12.3 mm; head dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 25) markedly cordate, basal angles acute, projected posteriorly, midlateral seta present, basolateral seta present; elytra with faint or moderate violet, blue, or green metallic reflection, elytral silhouette subrectangular, broad basally, basal margination (Fig. 32) straight or slightly concave; specimen from locality in southern Sierra Nevada (California) (Fig. 67).

DERIVATION OF TAXON NAME.—The name for this subspecies refers to the type-locality, Lamarck Creek, which in turn refers to Jean Baptiste Pierre Antoine Lamarck, the noted French naturalist and pioneer evolutionist.

GEOGRAPHICAL DISTRIBUTION.—Figure 67; restricted to the east slope of the southern Sierra Nevada. I have studied specimens from the following localities.

United States of America

CALIFORNIA: Inyo County, Big Pine Creek (below Finger Lake [3,140 m] [Aug.] (2; CAS), Lamarck Creek (above Upper Lamarck Lake [3,260 m–3,350 m] [July] (21; CAS, DHKa, UASM).

Nebria meanyi sylvatica, new subspecies

(Figures 26, 67)

Nebria meanyi: HATCH 1939:118 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Wash., Olympic N. P., Olympic Mts., Boulder Cr. at Olympic Hot Springs, 610m. 15Aug.74 D. H. Kavanaugh" / "D. H. Kavanaugh Collection" [orange label] / "Holotype *Nebria meanyi*

sylvatica Kavanaugh det. D. H. Kavanaugh 1976" [red label] / "California Academy of Sciences Type No. 12508." ALLOTYPE (same data as holotype) also in CAS. In total, 177 PARATYPES (83 males and 94 females) are deposited in the following collections: CAS, CNC, CUIC, DHKa, ICCM, JSch, UASM, USNM, UWBM.

TYPE-LOCALITY.—Boulder Creek (at Olympic Hot Springs), Olympic National Park, Washington.

DIAGNOSTIC COMBINATION.—Head moderate in size and width, dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 26) markedly cordate, basal sinuation of lateral margin very short and deep, midlateral seta present, basolateral seta present; elytra moderately convex, elytral silhouette subrectangular to subovoid, moderately broad basally, basal margination slightly short, humeral angles faintly or moderately obtuse, humeral carina present, slightly to markedly developed, elytral intervals markedly convex, fifth interval with three to six setae, markedly catenate, striae deeply impressed; specimen from locality on Vancouver Island (British Columbia) or Olympic Peninsula (Washington) (Fig. 67).

DERIVATION OF TAXON NAME.—This subspecies name is derived from the Latin word, *sylvaticus*, meaning "of the forest"—a reference to the deep forest habitat occupied by taxon members.

GEOGRAPHICAL DISTRIBUTION.—Figure 67; restricted to Vancouver Island, British Columbia, and the Olympic Peninsula, Washington. I have studied specimens from the following localities.

Canada

BRITISH COLUMBIA: Vancouver Island, Alberni (38 miles [ca. 61 km] w) [May] (1; CNC).

United States of America

WASHINGTON: Olympic National Park [Aug.] (11; ICCM, MCZ, UASM, USNM), Elwha River (at Elwha Campground) [Aug.] (1; CUIC), Dosewallips River (at Muscott Campground) [July] (3; UWBM), Olympic Hot Springs (Boulder Creek [670 m–760 m] [May–Aug.] (160; CAS, CNC, DHKa, JSch, UWBM), Sol Duc Hot Springs [July] (3; JSch, UWBM).

Nebria vandykei wyeast, new subspecies

(Figures 7, 68)

Nebria vandykei: *auctorum*. —ERWIN AND BALL 1972:87 (in part). —HATCH 1939:118 (in part). —LINDROTH 1961:86 (in part).

Nebria trifaria vandykei BÄNNINGER. —HATCH 1953:56 (in part).

HOLOTYPE, a male, in CAS, labelled: "U.S.A., Ore., Clackamas Co., Cascade Range, s. slope Mt. Hood, headwaters Salmon R. near Timberline Lodge, 1830m–1950m, 3 Aug.74

D. H. Kavanaugh"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria vandykei* wyeast Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12517." ALLOTYPE (same data as holotype) also in CAS. In total, 186 PARATYPES (104 males and 82 females) are deposited in the following collections: CAS, DHKa, MCZ, OSUO, UASM, USNM, UWBM.

TYPE-LOCALITY.—Salmon River headwaters, Mount Hood, Clackamas County, Oregon.

DIAGNOSTIC COMBINATION.—Size very large, standardized body length male greater than 12.0 mm, female greater than 12.5 mm; head dark, with a pair of pale paramedial spots on vertex; antennal scape (Fig. 7) narrowed basally, straight or slightly arcuate; pronotum with midlateral seta present, basolateral seta present; elytra without metallic reflection, elytral silhouette markedly ovoid; specimen from locality in Cascade Range south of Columbia River (Fig. 68).

DERIVATION OF TAXON NAME.—For this subspecies, I have selected that name given to Mount Hood by local native peoples—*Wy'east*, which means "The Mountain."

GEOGRAPHICAL DISTRIBUTION.—Figure 68: restricted to the Cascade Range south of the Columbia River; present known range from Mount Hood south to the Three Sisters area (Oregon). I have studied specimens from the following localities.

United States of America

OREGON: Deschutes County, Middle Sister Peak (E slope at North Fork Squaw Creek [1,950 m–2,190 m]) [Aug.] (19; CAS, DHKa); Hood River County, Mount Hood (1,740 m), Hood River Meadows Ski Area [1,920 m–1,950 m], headwaters of Salmon River near Timberline Lodge [1,830 m–1,950 m], Sand Creek [June–Aug.] (130; CAS, DHKa, UWBM); Marion County, Mount Jefferson (N slope [1,860 m–1,920 m], S end of Jefferson Park [1,830 m], Russell Creek [1,680 m–1,740 m], West Branch Whitewater River [1,830 m–1,890 m]) [Aug.] (39; CAS, DHKa, OSUO).

Nebria schwarzi beverlianna, new subspecies

(Figures 1, 27, 36, 69)

HOLOTYPE, a male, in CAS, labelled: "U.S., Wyo., Sublette Co., Gros Ventre Mts., Hwy. 187/189, 8 mi. NW, Bondurant, Hoback R., 6900', 1–2 August 73 DHKavanaugh Family"/ "D. H. Kavanaugh Collection" [orange label]/ "Holotype *Nebria schwarzi beverlianna* Kavanaugh det. D. H. Kavanaugh 1976" [red label]/ "California Academy of Sciences Type No. 12515." ALLOTYPE (same data as holotype) also in CAS. In total, 254 PARATYPES (133 males and 121 females) are deposited in the following collections: CAS, DHKa, FMNH, MCZ, ROM, UASM, USNM.

TYPE-LOCALITY.—Hoback River (8 miles [ca. 13 km] NW of Bondurant), Sublette County, Wyoming.

DIAGNOSTIC COMBINATION.—Figure 1; size very large, standardized body length male greater than 12.0 mm, female greater than 12.5 mm; head moderate in size and width, dark, with a pair of pale paramedial spots on vertex; pronotum (Fig. 27) slightly flattened, only slightly cordate, broad basally, midlateral seta present, basolateral seta present; elytra with marked violet, blue, or green metallic reflection, elytral silhouette subrectangular, broad basally; hind coxa (Fig. 36) with four to six basal and one (in very few individuals two or three) apical seta(-ae); specimen from locality in western Wyoming (Fig. 69).

DERIVATION OF TAXON NAME.—I take great pleasure in naming this subspecies in honor of my wife, Beverly Ann Kavanaugh, in grateful acknowledgment of her constant support through the course of this study.

GEOGRAPHICAL DISTRIBUTION.—Figure 69: at present known only from Hoback River at the south slope of the Gros Ventre Mountains. I have seen specimens from the following locality.

United States of America

WYOMING: Sublette County, Bondurant (8 miles [ca. 13 km] NW at Hoback River [2,100 m]) [July–Aug.] (255; CAS, DHKa, FMNH, MCZ, UASM, USNM).

Specimens Without Locality Data: (1; ROM).

Nebria trifaria utahensis, new subspecies

(Figures 8, 28, 45, 50, 70)

HOLOTYPE, a male, in CNC, labelled: "Lonesome Beaver, 7500', Henry Mts., Utah VII 20–22, 68 H. F. Howden"/ "Holotype *Nebria trifaria utahensis* Kavanaugh det. D. H. Kavanaugh 1976" [red label]. ALLOTYPE (same data as holotype) also in CNC. In total, 13 PARATYPES (9 males and 4 females) are deposited in the following collections: CAS, CNC, UASM.

TYPE-LOCALITY.—Lonesome Beaver, Henry Mountains, Garfield County, Utah.

DIAGNOSTIC COMBINATION.—Head moderate in size and width, dark, with a pair of pale paramedial spots on vertex; antennal scape (Fig. 8) slightly arcuate or straight, slightly to markedly narrowed basally; pronotum (Fig. 28) with basal sinuation of lateral margin moderately deep, midlateral seta present, basolateral seta present; elytra without metallic reflection, microsculpture deeply impressed, meshes isodiametric, elytral silhouette subovoid; hindwing reduced in width and length, truncate distal to stigma; male with apex of median lobe as in Figure 45; female with posterodorsal sclerite in bursa copulatrix

as in Figure 50; specimen from Henry Mountains (Utah) (Fig. 70).

DERIVATION OF TAXON NAME.—This subspecies is named for the State of Utah, in which its geographical range is restricted.

GEOGRAPHICAL DISTRIBUTION.—Figure 70; restricted to the Henry Mountains of southcentral Utah. I have studied specimens from the following localities.

United States of America

UTAH: Garfield County, Hanksville (24 miles [ca. 39 km] s [2,290 m]) [July] (3; CNC), Lonesome Beaver ([2,290 m]) [July] (12; CAS, CNC, UASM).

NOMENCLATURAL NOTES AND LECTOTYPE DESIGNATIONS

***Carabus gyllenhali* SCHÖNHERR, 1806:196.** [= *Nebria gyllenhali* (Schönherr).] **LECTOTYPE** (here designated), a male, in NRSS, labelled: "♂" / [triangular blue label] / "Lectotype *Carabus gyllenhali* Schönherr designated by D. H. Kavanaugh 1976" [red label]. Five paralectotypes (same data as lectotype) also in NRSS.

The name *Carabus rufescens* Strøm (1768:331) did not appear in the literature between the date of its original description and 1880, when Schøyen (1880:183) revived its use (Carl Lindroth, personal communication). Jeannel (1937:4), however, accepted *N. rufescens* as the senior synonym of *N. gyllenhali*; and, following him, a number of authors have subsequently applied the name "*rufescens*" to this species (Blair 1950:220; Friden 1971:30; Greenslade 1968:41; Horvatovitch 1973:252; Luff 1972:174; Luff and Davies 1972:47; Nakane 1963:18, 1971:180; and Ueno 1953:59, 1955:47). The combination *N. rufescens gyllenhali* has sporadically appeared (Jeanne 1966:12; and Jeannel 1937:4, 1941:19) as has the unfortunate combination *N. gyllenhali rufescens*, where "*rufescens*" referred variously to a subspecies, race, variety, or aberration of *N. gyllenhali* (Andrewes 1939:161; Bänninger 1925:345, 1960:261; Csiki 1927:359; Munster 1933:267; and Reitter 1908:93).

The name given to this particular species is of considerable importance. The accumulated literature on this species is very extensive, and its members are among the most broadly distributed and commonly collected of all carabid beetles. Both names have been so often used in the literature that a decision for or against either will

cause some confusion, but it is still more important to reach some decision which will provide for consistency in all future usage. Lindroth (1939:59, 1954:121, 1961:78) and Bänninger (1949:144) have refused to recognize *N. rufescens* as the valid name for this species. For the reasons they have cited, because no type-specimen has been found or perhaps ever existed, and because Strøm's original description "cannot be interpreted (not even as a *Nebria*)" (Carl Lindroth, personal communication), I concur that the name *N. gyllenhali* (Schönherr) should be conserved as the valid name for the species. Any future use of the epithet *rufescens* should be discouraged; and the name *Carabus rufescens* Strøm should be listed as a *nomen dubium*.

***Carabus nivalis* PAYKULL, 1790:52.** [= *Nebria nivalis* (Paykull).] **LECTOTYPE** (here designated), a male, in NRSS, labelled: "Mus. Payk." / "Riksmuseum Stockholm" [green label] / "Lectotype *Carabus nivalis* Paykull designated by D. H. Kavanaugh 1976" [red label].

The specimen chosen as lectotype of *Carabus nivalis* is one of three specimens so identified in NRSS from the Paykull Collection. The other two specimens are actually *Nebria gyllenhali gyllenhali* (Schönherr) adults. Because all three specimens bear identical labels and have traditionally been considered syntypes, the two *N. gyllenhali* specimens could perhaps be considered paralectotypes. Paykull (1798:119) subsequently described a "variety B" of *C. nivalis*, which is clearly synonymous with *N. gyllenhali gyllenhali* and was based on specimens from a different locality and collector. The original description of *C. nivalis* does not fit the two hetero-specific specimens, but the description of "variety B" does so. I conclude that these specimens are probably not part of Paykull's original type-series of *C. nivalis*; but they may be the specimens he described later as "variety B."

***Helobia castanipes* KIRBY, 1837:20.** [= *Nebria gyllenhali castanipes* (Kirby).] **LECTOTYPE** (here designated), a female, in BMNH, labelled: "Type" [red-trimmed disk] / "70" / "N. Amer." [pale blue disk with "5699" on underside] / "apparently Type of castanipes Kby. Lindroth 1952" / "Lectotype *Helobia castanipes* Kirby designated by D. H. Kavanaugh 1976" [red label].

The lectotype bears no label in Kirby's hand. However, according to P. M. Hammond (personal communication), the number "5699" on the underside of one label refers to an entry in manuscript catalogs of the Coleoptera in BMNH. An original label in Kirby's hand is pasted in the catalog at this entry and reads "73. 1. ♀?/ castanipes." The fate of the second of two specimens mentioned by Kirby in his original description is unknown.

***Nebria arkansana* CASEY, 1913:52.**

Lindroth (1961:70) was certainly correct in denying the validity of Casey's records for Arkansas and Indiana for this species; and his choice for the new type-locality ("Valley of the Upper San Juan River," Archuleta County, "Colorado") is quite reasonable. The specimens in Casey's series are labelled "Ind" and "S. Ark"; and it is at least possible that the latter refers to the South Arkansas River (a quite suitable locality for the species, in Chaffee County, Colorado) rather than to the State of Arkansas as supposed by Casey. It is also possible that "Ind" refers to the "Indian Territory," although general use of that name for the region was abandoned long before 1913.

***Nebria bifaria* MANNERHEIM, 1853:120.** [= *Nebria nivalis nivalis* (Paykull).] LECTOTYPE (here designated), a male, in ZILR, labelled: "38"/ "Nebria carbonaria Esch. Insel. Paul"/ "Lectotype ?" [red label]/ "Lectotype *Nebria bifaria* Mannerheim designated by D. H. Kavanaugh 1976" [red label].

***Nebria catenata* CASEY, 1913:49.** [= *Nebria trifaria catenata* Casey.] TYPE-LOCALITY.—Colorado; restricted by Erwin and Ball (1972:97) to San Juan Mountains, and here further restricted to Wolf Creek Pass, Mineral County, Colorado.

***Nebria diversa* LeCONTE, 1863a:2** [as a replacement name for *N. livida* LeConte]. LECTOTYPE (same as for *N. livida* LeConte; see below for data).

***Nebria elias* MOTSCHULSKY, 1865:274.** The type-specimen of *N. elias* has been completely destroyed and only its pin and labels remain (in ZMUM). Motschulsky's original description is too vague to permit assurance that *N. elias* and *N. gyllenhalii castanipes* are synony-

mous. The occurrence of the latter in Alaska (the type area of *N. elias*) is restricted and local, which casts further uncertainty as to appropriate application of the name. I therefore refrain from designation of a neotype and list *N. elias* as a *nomen dubium*, but, for convenience, place it as a synonym of *N. gyllenhalii castanipes*, following Lindroth (1961:78).

***Nebria eschscholtzii* MÉNÉTRIÉS, 1844:55.** LECTOTYPE (here designated), a female, in ZILR, labelled: [gold-coated square]/ "California" [pink label]/ "Eschscholtzii Menet. Californ." [red label]/ "Syntypus" [red label]/ "Lectotype *Nebria eschscholtzii* Menetries designated by D. H. Kavanaugh 1976" [red label]. One paralectotype also in ZILR. TYPE-LOCALITY.—California; here restricted to South Fork of American River, 3 miles [ca. 4.8 km] w of Riverton, El Dorado County, California.

***Nebria expansa* CASEY, 1913:56.** [= *Nebria lacustris* Casey, 1913:56.] TYPE-LOCALITY.—Indiana; here restricted to Turkey Run State Park, Parke County, Indiana.

The name *N. lacustris* Casey has priority over *N. expansa* by precedence of position as well as by action of first reviser (Bell 1955:265; see also Lindroth 1961:77). In his original description, Casey recorded *N. expansa* from "Texas and Indiana," based on his study of two females. Bell (1955:267) and Lindroth (1961:77, 1975:112) accepted the record from Texas. In my judgment, this record must be erroneous. Acting on my suggestion, Lindroth (1975:147) amended his lectotype designation (1975:112) and selected the Casey specimen labelled "L.," interpreted by Casey as from Indiana, instead of the "Texas" specimen. Individuals recognizable as the "*expansa*" form of *N. lacustris* have often been collected at the restricted type-locality chosen.

***Nebria fusiformis* VAN DYKE, 1926:11.** [= *Nebria spatulata spatulata* Van Dyke.]

Because this name appeared unaccompanied by any description or indication, it should be considered a *nomen nudum*. It is clear to me, however, from the text in which the name appeared, that Van Dyke was referring to his *N. spatulata*, the original description of which appeared the previous year.

Nebria gebleri DEJEAN, 1831:573. HOLOTYPE, a female, in MHNP, labelled: "Sitka"/ "Gebleri Eschs"/ "Ex Musaeo Mniszech"/ "Holotype *Nebria gebleri* Dejean det. D. H. Kavanaugh 1976" [red label].

It is clear from his original description that the specimen of *N. gebleri* seen by Dejean was at that time complete. In his review of the Dejean types, Lindroth (1955b:12) noted that the head and prothorax of the type-specimen had been lost. In my study of the type (in 1976), I found it to be complete again! Unfortunately, the parts replaced are not only from a different specimen but also from one representing a different species [namely, *Nebria picicornis* (Fabricius)]. There is no doubt, however, that the pterothorax and abdomen (through which the pin passes) are the recognizable remains of the valid type-specimen.

Nebria gregaria FISCHER VON WALDHEIM, 1821:72. LECTOTYPE (here designated), a male, in ZMUM, labelled: "47. gregaria Fisch."/"Lectotype *Nebria gregaria* Fischer v. Wald. designated by D. H. Kavanaugh 1976" [red label].

Fischer (1821:73) indicated that his description of *N. gregaria* was based on material in his own and Eschscholtz's collections. I have been unable to locate any Eschscholtz specimens of *N. gregaria* from among those in UMHF. Apparently, the single Fischer specimen (ZMUM) chosen as lectotype is the only survivor from the type-series.

Nebria hudsonica LECONTE, 1863b:3. LECTOTYPE (here designated), a male, in MCZ, labelled: "Saskatchewan"/ "Type 643" [red label]/ "N. hudsonica LeC."/"Lectotype *Nebria hudsonica* LeConte designated by D. H. Kavanaugh 1976" [red label]. TYPE-LOCALITY.—Saskatchewan, Hudson's Bay Territory; here restricted to North Saskatchewan River at Rocky Mountain House, Alberta.

In 1863, the area now occupied by the Province of Saskatchewan was part of Hudson's Bay Territory (or the Northwest Territories), and at least up to that date, the name "Saskatchewan" was apparently applied only to the Saskatchewan River system. Therefore, LeConte's use of the name as a type-locality probably refers to the river system rather than the province. Only those parts of the system in Alberta are within

the continuous range of *N. hudsonica*, although I have seen two specimens from localities in the Province of Saskatchewan. My selection of the restricted type-locality reflects these facts and considerations.

Nebria incerta CASEY, 1913:53. [= *Nebria obliqua* LeConte.] TYPE-LOCALITY.—Colorado; here restricted to North Fork of South Platte Canyon at Santa Maria, Park County, Colorado. This restricted type-locality is the same as for *N. obliqua*.

Nebria ingens HORN, 1870:98. LECTOTYPE (here designated), a female, in MCZ, labelled: "Cala."/"Type No. 1026" [red label]/ "Nebria ingens Horn"/ "Lectotype *Nebria ingens* Horn designated by D. H. Kavanaugh 1976" [red label]. One female paralectotype, also in MCZ, labelled: "Cala."/"Type 8127 [red label]/ "N. ingens Horn." TYPE-LOCALITY.—Sierra Nevada Mountains east of Visalia, California; here restricted to Franklin Lakes, Tulare County, California.

In his original description, Horn mentioned two specimens, a male and a female. The MCZ specimen seen by Lindroth (1961:87), his "allotype," is a female. The other specimen, from the Horn Collection (formerly at ANSP, now at MCZ), is also a female; so Horn did not actually see a male of this species. The lectotype chosen is the specimen from the Horn Collection.

Nebria livida LECONTE, 1859:84 [preoccupied by *Carabus lividus* Linnaeus, 1758:414; = *Nebria diversa* LeConte]. LECTOTYPE (here designated), a male, in MCZ, labelled: [blue disk]/ "Type 642" [red label]/ "N. diversa LeC. || livida LeC."/"Lectotype *Nebria livida* LeConte designated by D. H. Kavanaugh 1976" [red label]. One male paralectotype (same data as lectotype) also in MCZ.

Nebria longula LECONTE, 1878:478. [= *Nebria suturalis* LeConte—NEW SYNONYMY.] TYPE-LOCALITY.—Colorado; here restricted to Longs Peak, Rocky Mountain National Park, Colorado.

To date, all Colorado records for *N. suturalis* have been from the Front Range of the Rocky Mountains. The restricted type-locality is a protected wilderness area in that range.

Nebria mannerheimii FISCHER VON WALDHEIM, 1828:253. LECTOTYPE (here designated), a male, in ZMUM, labelled: "Sitcha"/ "48. mannerheimii Fisch."/ "Lectotype *Nebria mannerheimii* Fischer v. Wald. designated by D. H. Kavanaugh 1976" [red label]. One male paralectotype in UMHF.

Both specimens that I recognize as comprising the type-series of *N. mannerheimii* were probably those collected by Eschscholtz (Fischer von Waldheim 1828:253). The specimen chosen as lectotype is from the Fischer Collection (ZMUM). The paralectotype is from the Mannerheim Collection (UMHF) and bears an "Eschsch." label.

Nebria metallica FISCHER VON WALDHEIM, 1821:71. LECTOTYPE (here designated), a male, in ZMUM, labelled: "Unalashka. F."/ "73 metallica Fisch."/ "Lectotype *Nebria metallica* Fischer v. Wald. designated by D. H. Kavanaugh 1976" [red label]. One male and one female paralectotype are in UMHF.

Fischer's description of *N. metallica* was based on material in his own and Eschscholtz's collections (Fischer von Waldheim 1821:72). Specimens from the latter, identified as such, are now in UMHF as part of the Mannerheim Collection. I have chosen the Fischer Collection specimen as lectotype, the two Eschscholtz specimens as paralectotypes. A fourth specimen, in the Fischer Collection (ZMUM), bears a "Kadjak" [=Kodiak] label and is thus excluded from the type-series.

Nebria moesta LECONTE, 1850:209. [= *Nebria gyllenhalii castanipes* (Kirby).] LECTOTYPE (here designated), a male, in MCZ, labelled: [light green disk]/ "Type 645" [red label]/ "N. moesta LeC."/ "N. castanipes Kby."/ "Lectotype *Nebria moesta* LeConte designated by D. H. Kavanaugh 1976" [red label]. One male and two female paralectotypes (same data as lectotype) also in MCZ.

Nebria mollis MOTSCHULSKY, 1865:274. [= *Nebria nivalis nivalis* (Paykull).] LECTOTYPE (here designated), sex undetermined (specimen incomplete, badly damaged), in ZMUM, labelled: "A. borealis" [green label]/ "Nebria mollis Motsch. Am. arc. cont." [green label]/ [red rectangle]/ "Lectotype *Nebria mollis*

Motschulsky designated by D. H. Kavanaugh 1976" [red label].

In his original description, Motschulsky presented the species epithet as "*molbis*." I have found no published statement by Motschulsky that "*molbis*" was a misspelling. However, the type-specimen is labelled "*mollis*"; from as early as 1868, every subsequent citation of the name has used the latter spelling. This suggests early recognition, possibly initiated (privately) by Motschulsky himself, of an original error. The first clear indication of an intended emendation is that of Csiki (1927:389).

Nebria mühlenbergii STURM, 1826:173 [here emended to *Nebria muehlenbergii* Sturm].

Because Sturm never selected type-specimens, none exists for this name. Furthermore, no description ever accompanied the use of this name. However, Sturm (1843:16) subsequently cited *N. muehlenbergii* as a synonym of *N. pallipes*, thereby providing the only clue to his application of the name to a taxon. The name should be treated as a *nomen nudum*.

Nebria obliqua LECONTE, 1866c:363. LECTOTYPE (here designated), a male, in MCZ, labelled: "Col."/ "Type 646" [red label]/ "Nebria obliqua Lec. Lewis Col."/ "obliqua 2"/ "Lectotype *Nebria obliqua* LeConte designated by D. H. Kavanaugh 1976" [red label]. One female paralectotype (same data as lectotype) also in MCZ. TYPE-LOCALITY.—Colorado; here restricted to North Fork of South Platte Canyon at Santa Maria, Park County, Colorado.

The type-locality of *N. obliqua*, as originally stated, was Colorado. LeConte (1878:478) subsequently listed "North Fork of South Platte Cañon (7,000 to 8,000 ft.)" as a locality for the species, and Lindroth (1961:73) accepted this as the type-locality. I here formally restrict the type-locality to that area.

Nebria obtusa LECONTE, 1878:478. [= *Nebria obliqua* LeConte—NEW SYNONYMY.]

My interpretation of LeConte's original description of *N. obtusa* is that the name is based on a single specimen (see LeConte 1878:479, lines 7–8). I therefore consider the type-specimen (in MCZ) to be a holotype. The synonymy noted here was actually suggested by LeConte

(1878:479) and is supported by abundant data (Kavanaugh, manuscript in preparation).

Nebria oregona CASEY, 1913:52. [= *Nebria mannerheimii* Fischer von Waldheim.] TYPE-LOCALITY.—Clackamas County, Oregon; here restricted to Zigzag River at Rhododendron, Clackamas County, Oregon.

Nebria ovipennis LeCONTE, 1878:477. TYPE-LOCALITY.—Sierra Nevada, California; here restricted to Mount Conness (east slope, above Greenstone Lake), Mono County, California.

The holotype of *N. ovipennis* (in MCZ) is representative of populations north of Mount Lyell, Yosemite National Park, but not south of that point in the Sierra Nevada. The restricted type-locality chosen is therefore both more precise and appropriate for the form represented by the type-specimen.

Nebria pallipes SAY, 1823:78.

Lindroth (1969a:1149, and in Lindroth and Freitag 1969:326) discussed the problem of establishing the actual publication date of Say's paper in which the original description of *N. pallipes* appeared. His comments, however, support the date cited above, rather than 1825, the year Lindroth (1961:76) cited.

Nebria rathvoni LeCONTE, 1853:400. [= *Nebria gebleri rathvoni* LeConte—NEW STATUS.] HOLOTYPE, a male, in MCZ, labelled: "6456 ft. Lake Tahoe, Cal. May 24, 1879" [light green square]/ "79." [red-tipped label]/ "N. rathvoni LeC." [red label]/ "Holotype *Nebria rathvoni* LeConte det. D. H. Kavanaugh 1976" [red label]. TYPE-LOCALITY.—Sacramento, California; here emended to Truckee River at Truckee, Nevada County, California.

There is no reason to doubt that the specimen recognized here as the holotype of *N. rathvoni* is actually the specimen seen by LeConte, although locality and date data on one label indicate otherwise. It is the only specimen of this taxon in the LeConte Collection (MCZ). Furthermore, the troublesome specimen label itself appears to be relatively new, and I suspect that it has been more recently added to the original type-specimen and thereby represents a mislabelling.

LeConte's type-locality, Sacramento, is well outside the habitat range of the taxon; so the type was surely not collected there (although Sacramento was probably the closest important town to the true collection site. Truckee, the emended type-locality, is about at the midpoint of both the habitat and geographical ranges of the taxon.

Nebria sahlbergii FISCHER VON WALDHEIM, 1828:254. LECTOTYPE (here designated), a male, in UMHF, labelled: "♂" [red label]/ "Eschsch." [red label]/ "Sitka" [red label]/ "Lectotype *Nebria sahlbergii* Fischer v. Wald. designated by D. H. Kavanaugh 1976" [red label]/ "Lectotype *Nebria violacea* Motsch. designated by D. H. Kavanaugh 1976" [red label].

Fischer's description of *N. sahlbergii* was based on a study of Eschscholtz material (Fischer von Waldheim 1828:254). I have located only two specimens probably representing the original type-series—one in the Fischer Collection (ZMUM), the other in the Mannerheim Collection (UMHF). I have chosen the UMHF specimen as lectotype because, first, the original description better fits this specimen, and, second, the Fischer (ZMUM) specimen is actually a representative of *N. gyllenhali castanipes* rather than *N. sahlbergii* as the latter name was applied by Lindroth (1961:68). The Fischer specimen must be considered a paralectotype of *N. sahlbergii* in spite of its identity. In fact, the strange misuse of the name "*sahlbergii*" by numerous North American authors in referring to *N. gyllenhali castanipes* (Kirby) (e.g., Casey 1913:51; Hatch 1939:120; Horn 1870:102; LeConte 1853:400, 1878:479) can only now be explained—that is, if these authors assumed that the Fischer specimen was the type of *N. sahlbergii*. I choose not to follow their interpretation in order to preserve the name *Helobia castanipes* Kirby (see above), which would become an objective junior synonym of *N. sahlbergii* if the Fischer specimen were designated as lectotype.

Nebria suturalis LeCONTE, 1850:209. LECTOTYPE (here designated), a male, in MCZ, labelled: [light green disk]/ "Type 650" [red label]/ "suturalis 3" [red label]/ "Lectotype *Nebria suturalis* LeConte designated by D. H. Kavanaugh 1976" [red label]. Two female paralectotypes (same data as lectotype) also in MCZ.

Nebria tenuipes CASEY, 1913:51. [= *Nebria eschscholtzii* Ménétriés.] TYPE-LOCALITY.—Alameda County, California; here restricted to Niles Canyon, Alameda County, California.

Nebria texana CASEY, 1913:54. [= *Nebria obliqua* LeConte.] TYPE-LOCALITY.—"Texas."

The holotype of *N. texana* (in USNM) bears the label "Tex.," interpreted by Casey as referring to the State of Texas (a highly improbable record). It is more probable that the specimen was collected in Colorado, perhaps at Texas Creek, a small tributary of the Arkansas River, Fremont County, Colorado. However, I prefer not to amend or restrict the type-locality at present, pending further field search in the mountainous regions of western Texas.

Nebria trifaria LeCONTE, 1878:478. LECTOTYPE (here designated), a female, in MCZ, labelled: "9500 ft. Amer. Fork Canon Utah, Aug. 2-3, 1877"/ "Type 651" [red label]/ "N. trifaria LeC."/ "Lectotype *Nebria trifaria* LeConte designated by D. H. Kavanaugh 1976" [red label].

Nebria vandykei BÄNNINGER, 1928:5. LECTOTYPE (here designated), a male, in ETHZ, labelled: "Paradise Val. Mt. Rainier Wash. VII-18-1920"/ "Col. by E. C. Van Dyke"/ "1. Fühl.gld. as. 1 + 2 B."/ "FG. Basig. bil. OP!"/ "Nebria trifaria LeC."/ "Type *Nebria* Van Dykei 10.1927" [red-trimmed label]/ "Lectotype *Nebria vandykei* Bänninger designated by D. H. Kavanaugh 1976" [red label]. Two paralectotypes also in ETHZ.

In his original description, Bänninger mentioned four specimens in the type-series, but only three of these are accounted for at present (W. Sauter, personal communication).

Nebria violacea MOTSCHULSKY, 1850:73. [= *Nebria sahlbergii sahlbergii* Fischer von Waldheim.] LECTOTYPE (here designated), same specimen as lectotype of *Nebria sahlbergii* Fischer von Waldheim (see above).

Mannerheim apparently obtained and examined the Eschscholtz specimen of *N. sahlbergii* now in UMHF, studied the specimen identified as *N. sahlbergii* in Fischer's Collection (ZMUM), and then noted (Mannerheim 1843:189) that two "varieties" existed. He called the form represented by the Eschscholtz specimen in his pos-

session "var. B." Motschulsky (1850:73), referring to Mannerheim's brief description of variety "B.," named this form *N. violacea*. Consequently, the specimen now in UMHF appears to be the specimen upon which both *N. violacea* and *N. sahlbergii* are based. I have therefore designated and so labelled the specimen as lectotype for both names.

Nebria viridis HORN, 1870:101. [= *Nebria frigida* R. F. Sahlberg.] LECTOTYPE (here designated), a male, in MCZ, labelled: "R. [superscript "M"] A."/ "Type No. 1027-" [red label]/ "N. viridis Horn"/ "Lectotype *Nebria viridis* Horn designated by D. H. Kavanaugh 1976" [red label]. One male paralectotype (same data as lectotype) also in MCZ.

In Horn's original description, only two specimens are mentioned. There are now three specimens in MCZ (one from the Horn Collection, two from the LeConte Collection). I have designated the Horn specimen as lectotype and the first LeConte specimen as the paralectotype. The second LeConte specimen (labelled "viridis 2") has no type status. All three specimens bear identical first labels; but LeConte may have received his second specimen directly from Ulke (see Horn 1870:14), his first specimen from Horn.

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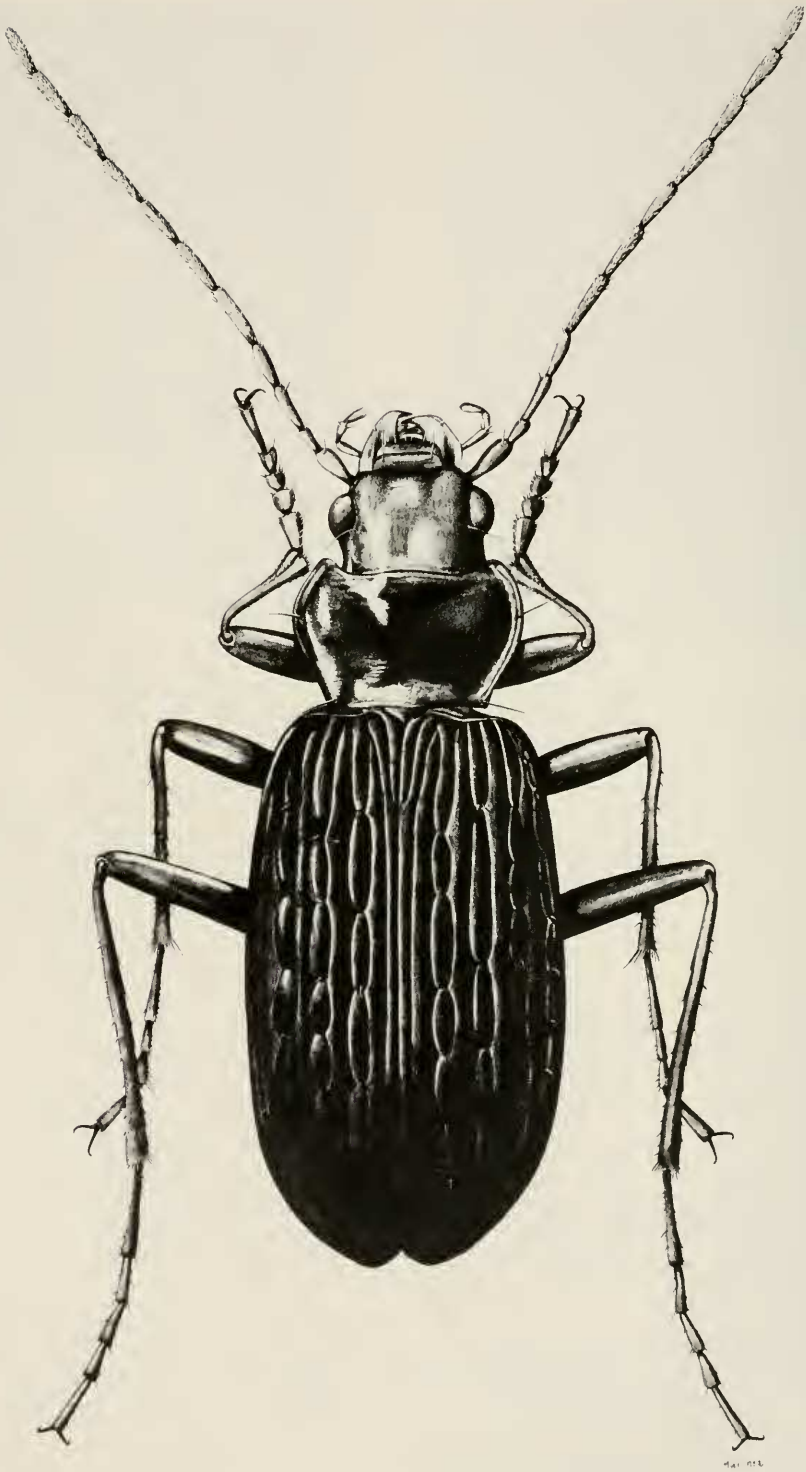
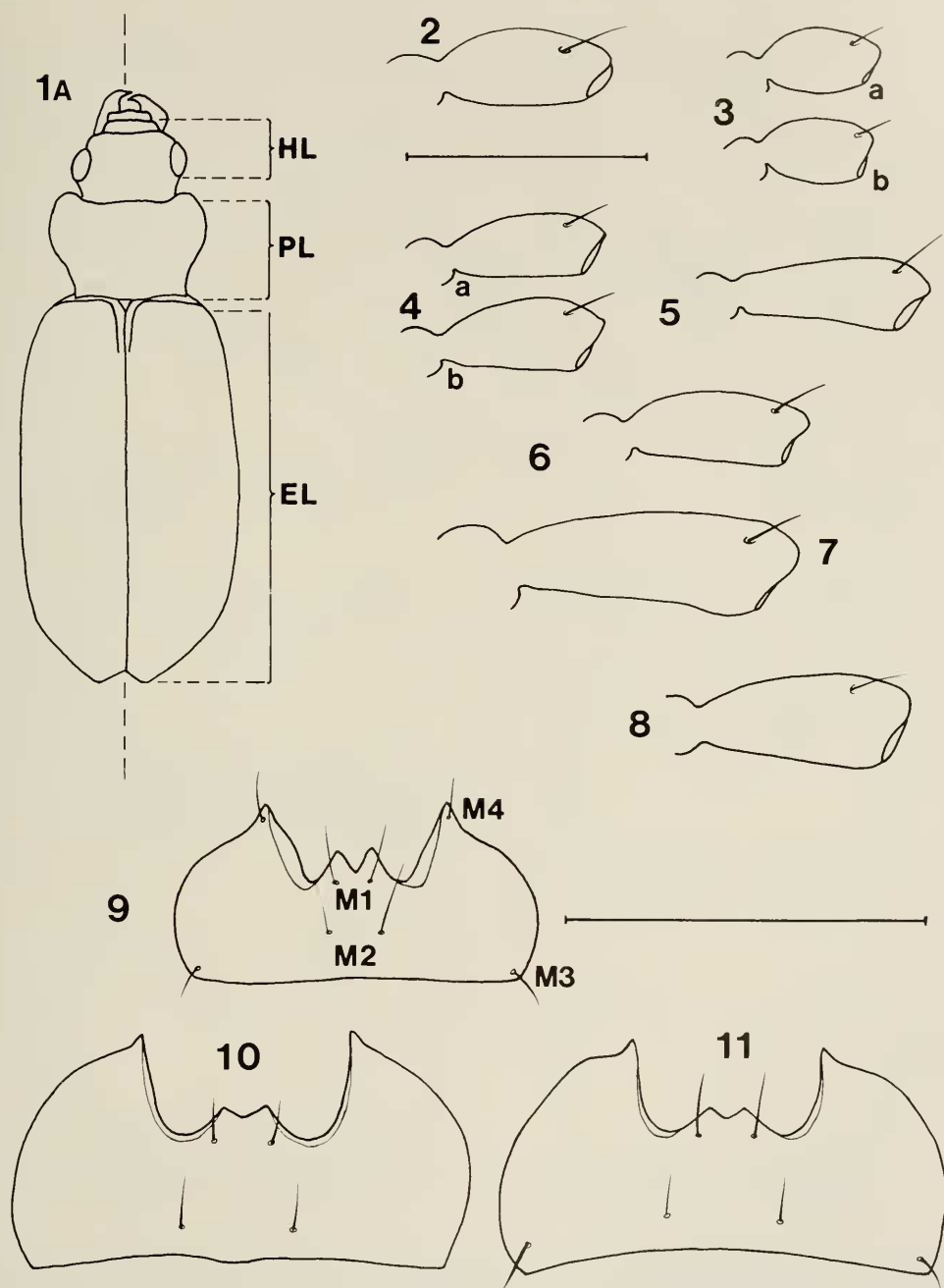
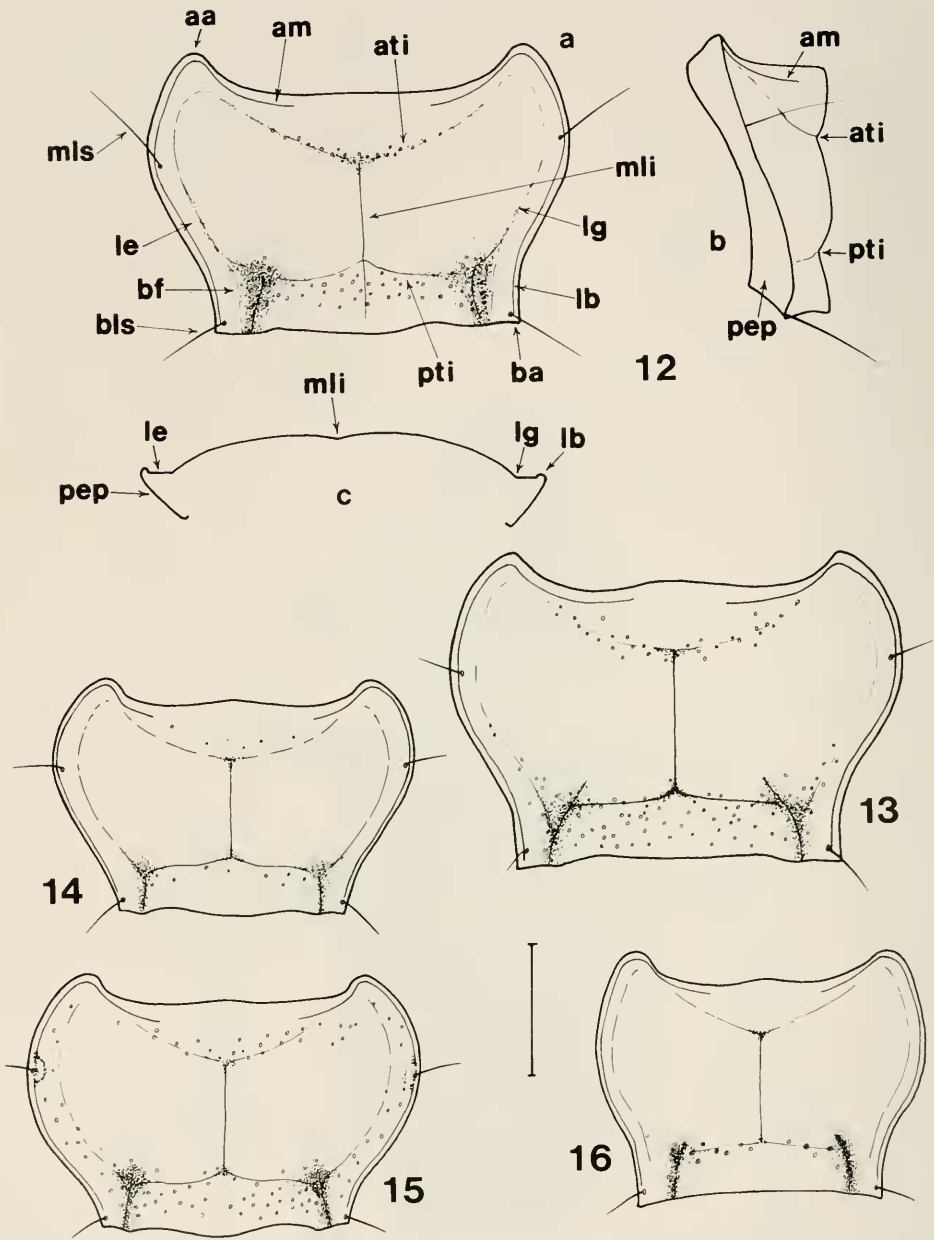


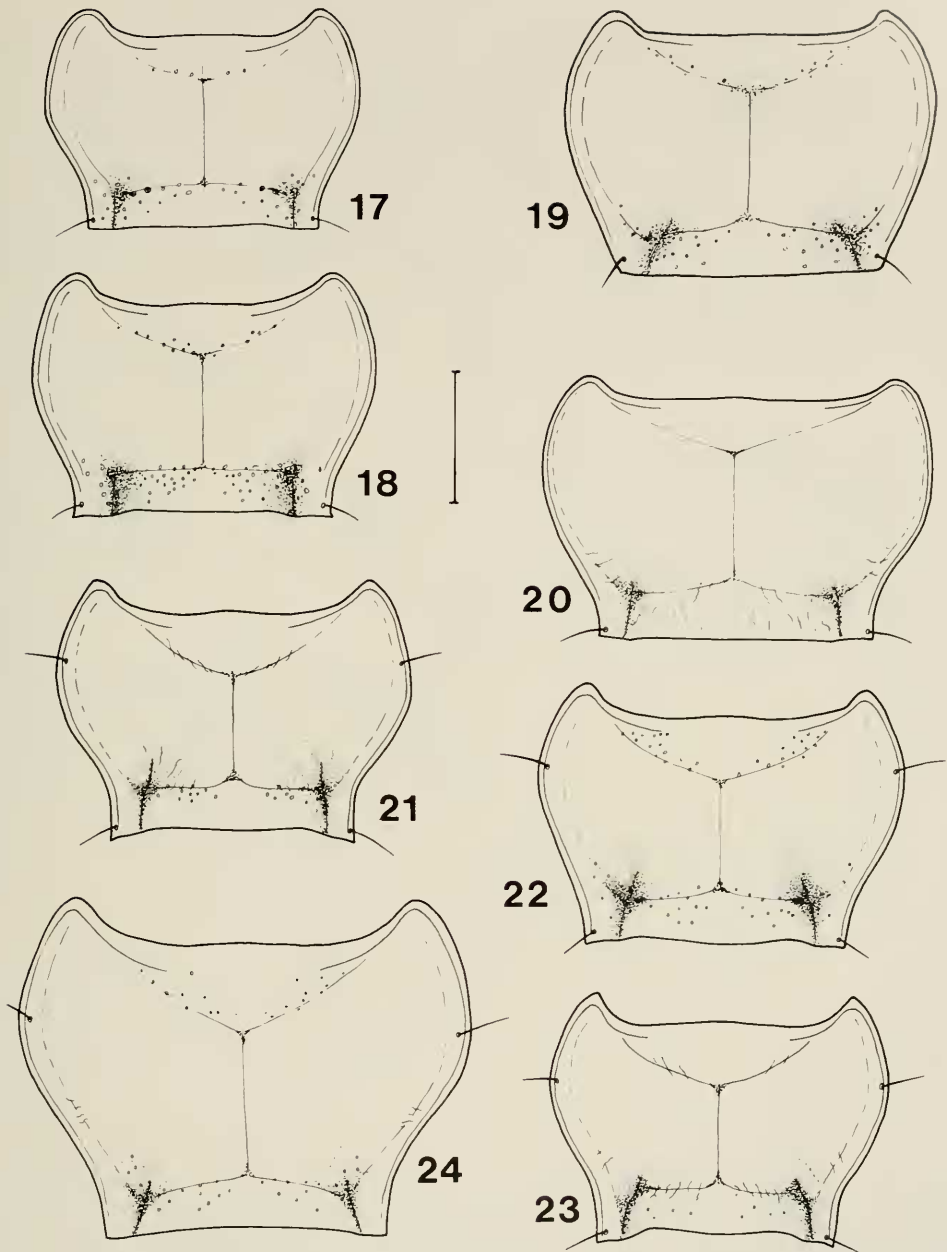
FIGURE 1. *Nebria schwarzi beverlianna*, new subspecies: adult male, dorsal aspect (approximately 6 times actual size). (Illustration by C. L. Mullinex.)



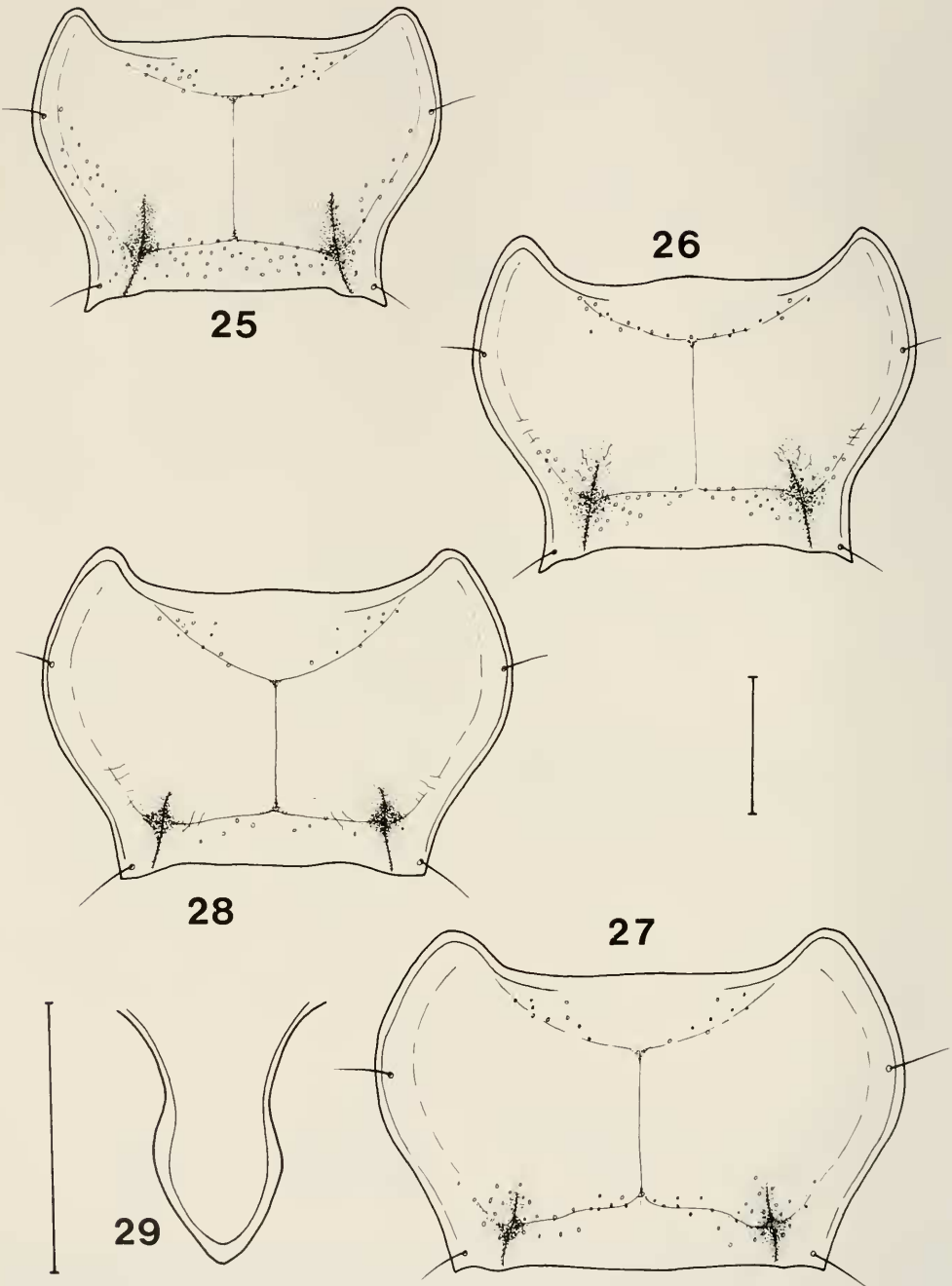
FIGURES 1-11. Fig. 1. Components of "standardized body length" measurement: HL = head length; PL = pronotal length; EL = elytral length. Figs. 2-8. Right antennal scape, dorsal aspect. 2. *Nebria gouleti* n.sp. (Underwood, Washington). 3. *Nebria gyllenhali lassenensis* n.ssp. (a. Mount Lassen, California; b. Todd Lake, Oregon). 4. *Nebria gyllenhali lindrothi* n.ssp. (a. Brooklyn Lake, Wyoming; b. Rio Puerco, New Mexico). 5. *Nebria zioni oasis* n.ssp. (Pine Valley Mountains, Utah). 6. *Nebria spatulata sierrae* n.ssp. (Big Horn Lake, California). 7. *Nebria vandykei* wyeast n.ssp. (Mount Hood, Oregon). 8. *Nebria trifaria utahensis* n.ssp. (Henry Mountains, Utah). Figs. 9-11. Mentum, ventral aspect. 9. General form and chaetotaxy; M₁ through M₄ are designations for specific pairs of setae. 10. *Nebria carri* n.sp. (Dollarhide Summit, Idaho). 11. *Nebria kincaidi balli* n.ssp. (Mount Hood, Oregon). All scale lines equal 1.0 mm.



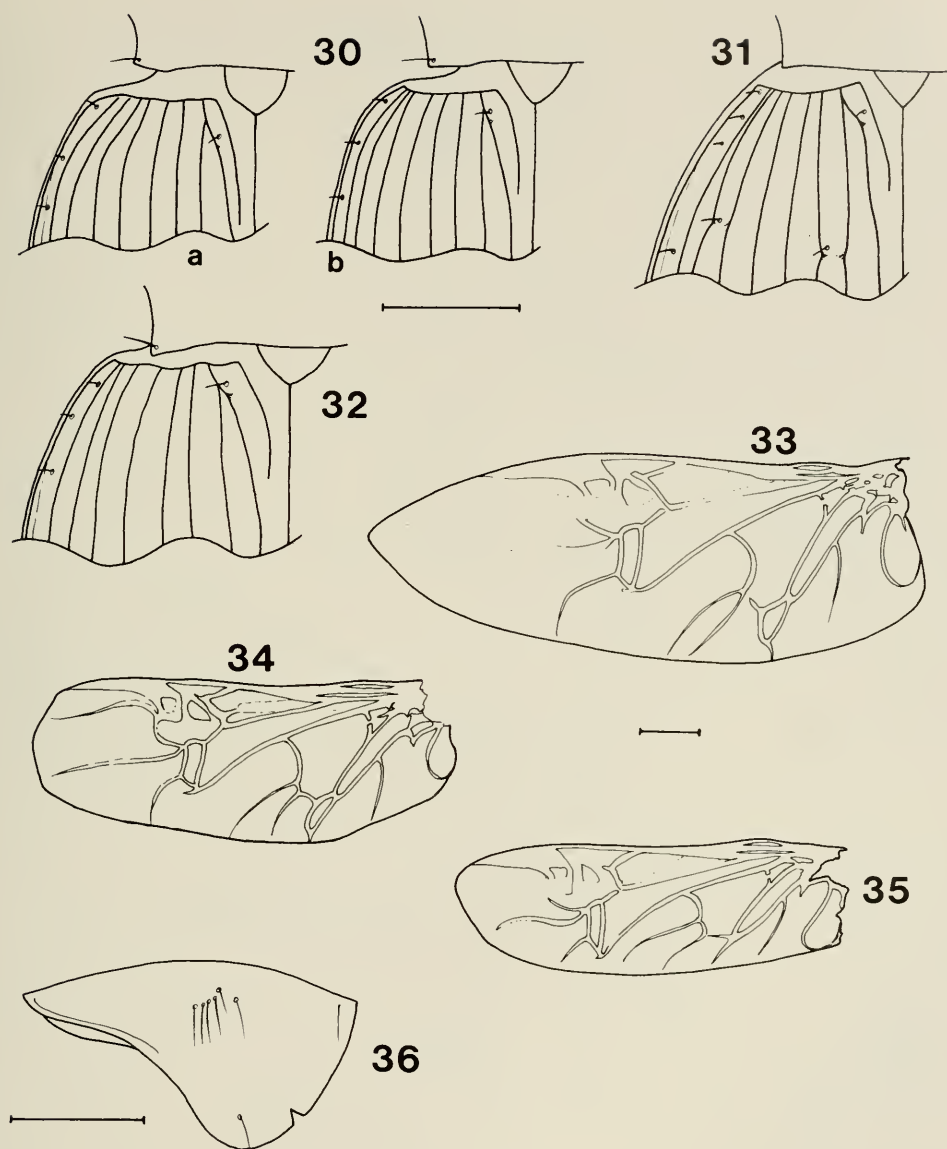
FIGURES 12-16. Fig. 12. Pronotum, general form and associated terms (a. dorsal aspect; b. left lateral aspect; c. cross-sectional aspect); abbreviation code: *aa* = apical angle; *am* = apical margination; *ati* = anterior transverse impression; *ba* = basal angle; *bf* = basal fovea; *bls* = basolateral seta; *lb* = lateral bead (= lateral margination); *le* = lateral explanation; *lg* = lateral groove; *mli* = median longitudinal impression; *mli* = midlateral seta; *pep* = proepipleuron; *pti* = posterior transverse impression. Figs. 13-16. Pronotum, dorsal aspect. 13. *Nebria goudeti* n.sp. (Salmon River, Idaho). 14. *Nebria lacustris bellorum* n.ssp. (Great Balsam Mountains, North Carolina). 15. *Nebria nivalis gaspesiana* n.ssp. (Mont Albert, Québec). 16. *Nebria acuta quileute* n.ssp. (Olympic Hot Springs, Washington). Scale line equals 1.0 mm.



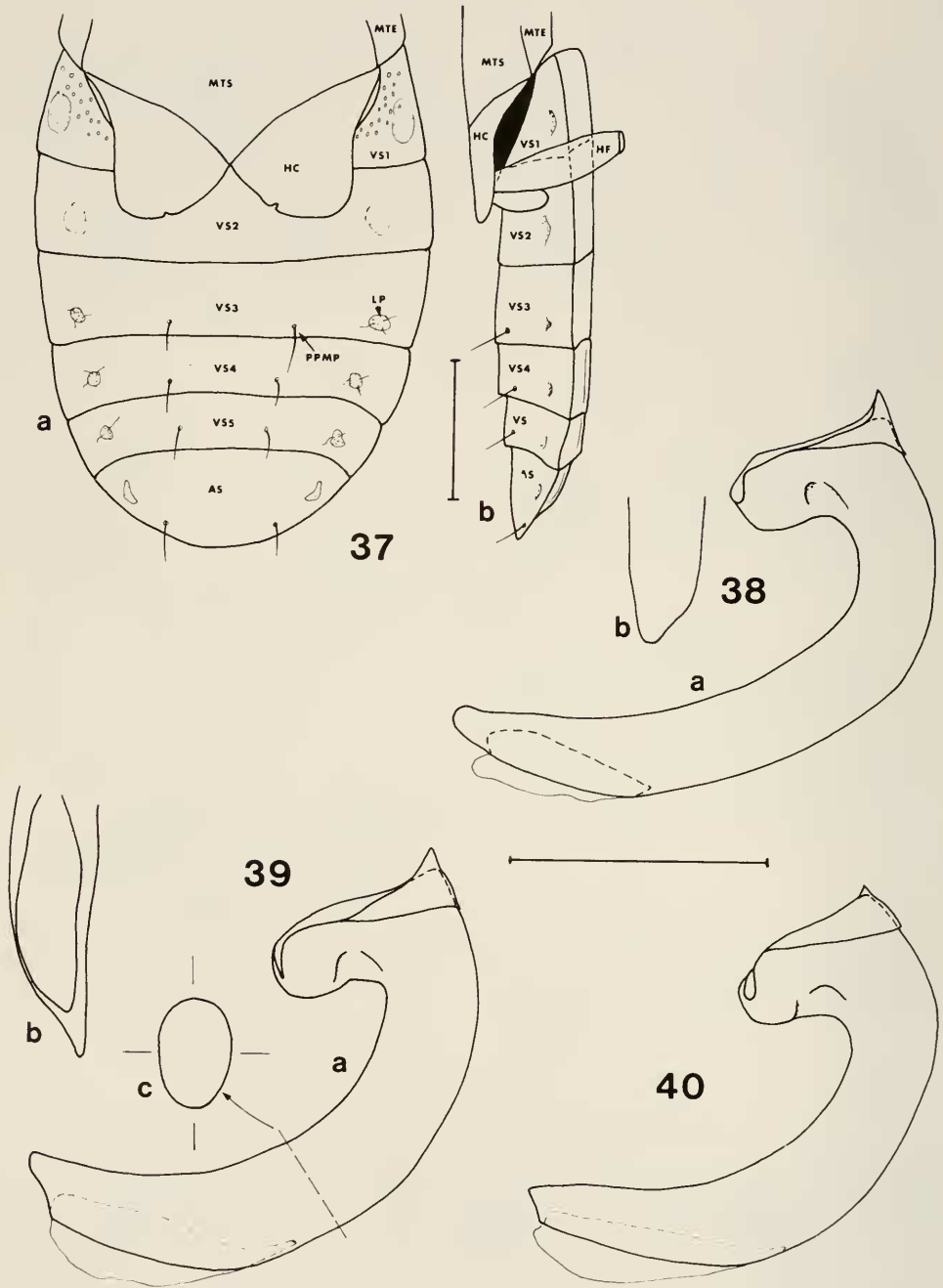
FIGURES 17-24. Pronotum, dorsal aspect. 17. *Nebria sahlbergii modoc* n.ssp. (Warner Mountains, California). 18. *Nebria sahlbergii triad* n.ssp. (Trinity Alps, California). 19. *Nebria obliqua chuskae* n.ssp. (Chuska Mountains, Arizona). 20. *Nebria darlingtoni* n.sp. (Kyburz, California). 21. *Nebria gebleri cascadenis* n.ssp. (Glacier, Washington). 22. *Nebria gebleri fragariae* n.ssp. (Strawberry Mountains, Oregon). 23. *Nebria gebleri siskiyouensis* n.ssp. (Trinity Alps, California). 24. *Nebria carri* n.sp. (Dollarhide Summit, Idaho). Scale line equals 1.0 mm.



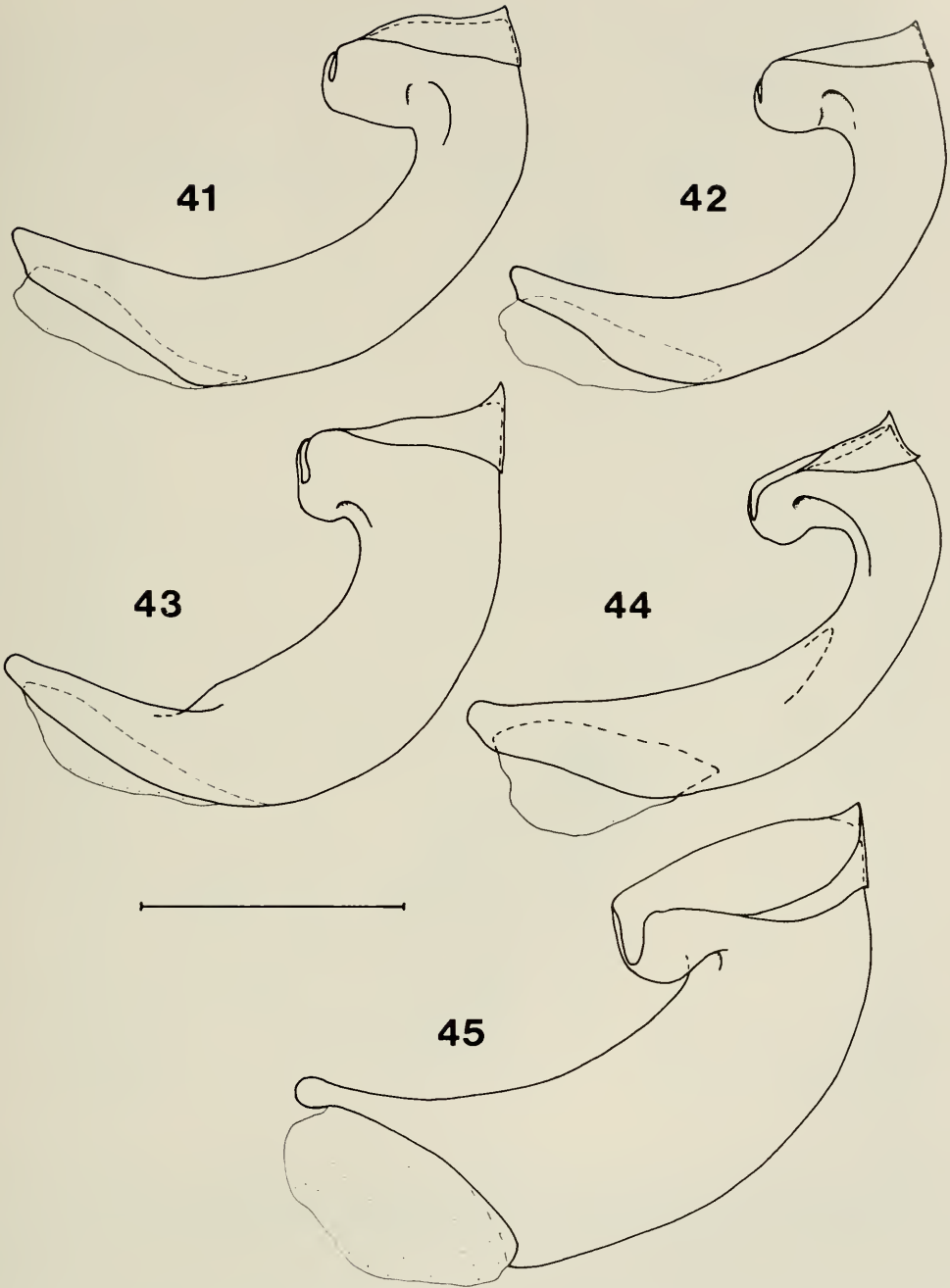
FIGURES 25-29. Figs. 25-28. Pronotum, dorsal aspect. 25. *Nebria meanyi lamarkensis* n.ssp. (Upper Lamarck Lake, California). 26. *Nebria meanyi sylvatica* n.ssp. (Olympic Hot Springs, Washington). 27. *Nebria schwarzi beverlianna* n.ssp. (Hoback River, Wyoming). 28. *Nebria trifaria utahensis* n.ssp. (Henry Mountains, Utah). Fig. 29. Prosternal intercoxal process, *Nebria lituyae* n.sp. (Mount Blunt, Lituya Bay, Alaska). All scale lines equal 1.0 mm.



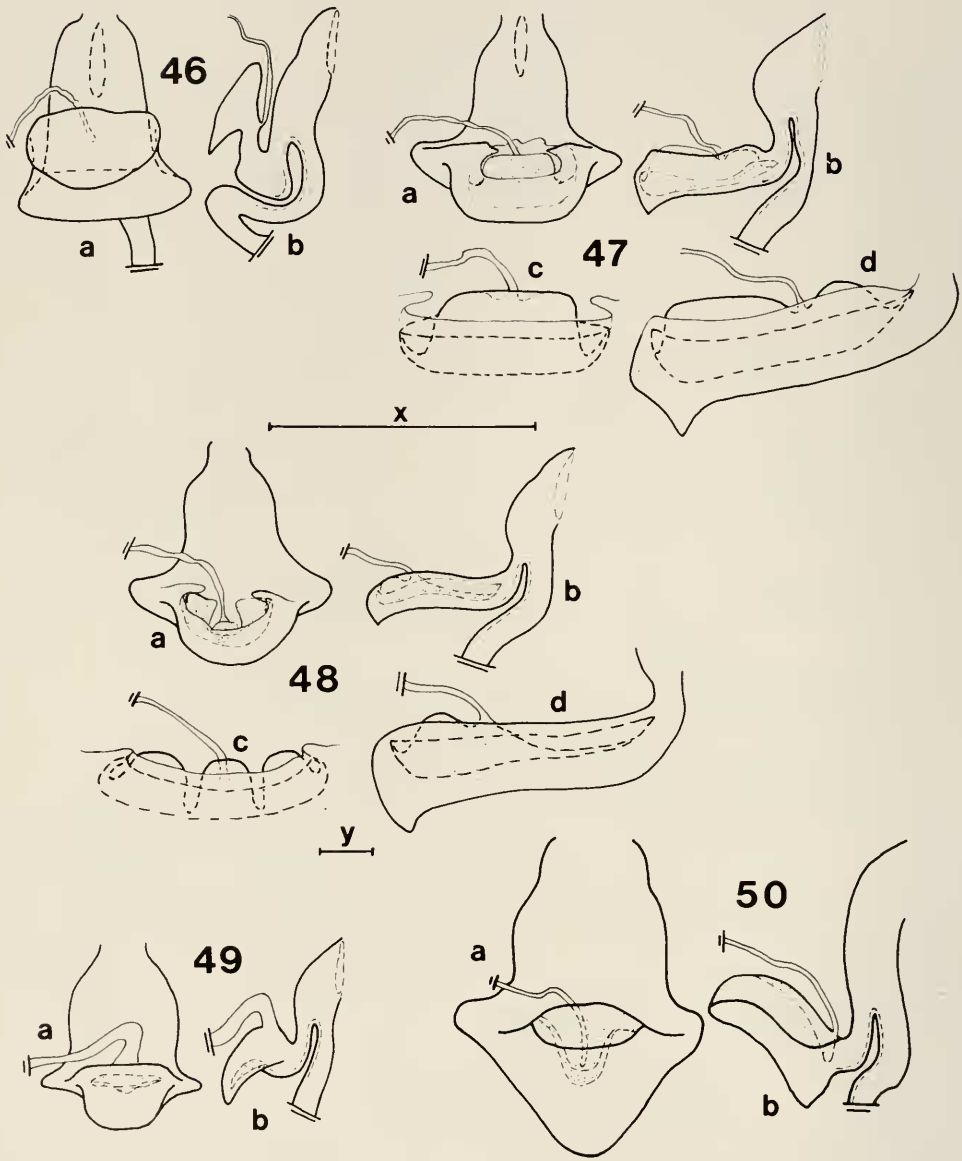
FIGURES 30-36. Figs. 30-32. Basal region of left elytron, dorsal aspect. 30. *Nebria arkansana edwardsi* n.ssp. (a. Rancheria, Yukon Territory; b. Gorge Creek, Alberta). 31. *Nebria kincaidi balli* n.ssp. (Mount Rainier, Washington). 32. *Nebria meanyi lamarekensis* n.ssp. (Upper Lamarck Lake, California). Figs. 33-35. Left hindwing. 33. Full-sized wing, *Nebria arkansana edwardsi* n.ssp. (Logan Pass, Montana). 34. Wing reduced in length, *Nebria obliqua chuskae* n.ssp. (Chuska Mountains, Arizona). 35. Wing reduced in length and width, *Nebria arkansana uinta* n.ssp. (Logan River, Utah). Fig. 36. Right hind coxa, ventral aspect, *Nebria schwarzi beverlianna* n.ssp. (Hoback River, Wyoming). All scale lines equal 1.0 mm.



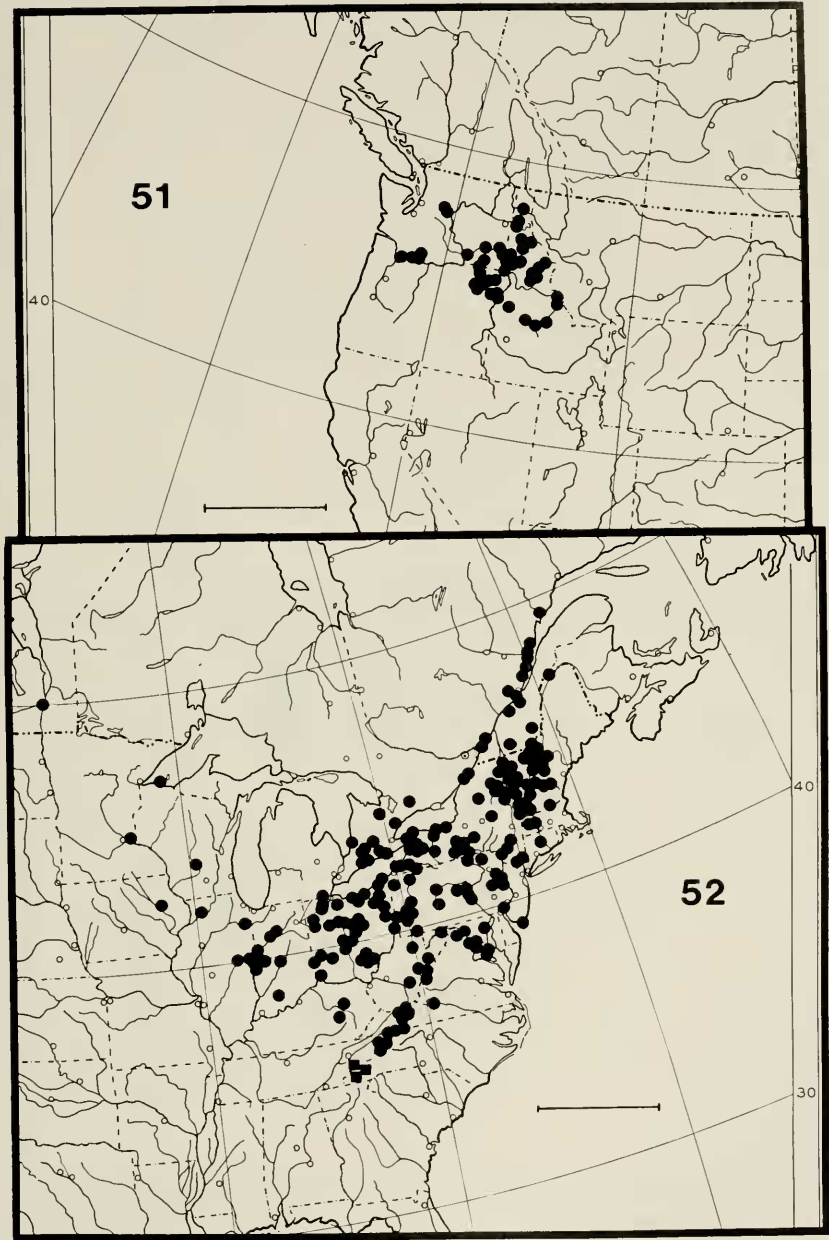
FIGURES 37-40. Fig. 37. Abdominal venter, form and associated terms (a. ventral aspect; b. left lateral aspect); abbreviation code: AS = anal sternum; HC = hind coxa; HF = hind femur; LP = lateral pit; MTE = metepisternum; MTS = metasternum; PPMP = posterior paramedial puncture and associated seta; VS1 to VS5 = first to fifth visible abdominal sterna. Figs. 38-40. Median lobe of male genitalia. 38. *Nebria acuta quileute* n.ssp. (Olympic Hot Springs, Washington) (a. left lateral aspect; b. ventral aspect, apical region only). 39. *Nebria arkansana edwardsi* n.ssp. (Yoho National Park, British Columbia) (a. left lateral aspect; b. dorsal aspect, apical region only; c. cross section at middle of shaft). 40. *Nebria arkansana oowah* n.ssp. (La Sal Mountains, Utah) (left lateral aspect). All scale lines equal 1.0 mm.



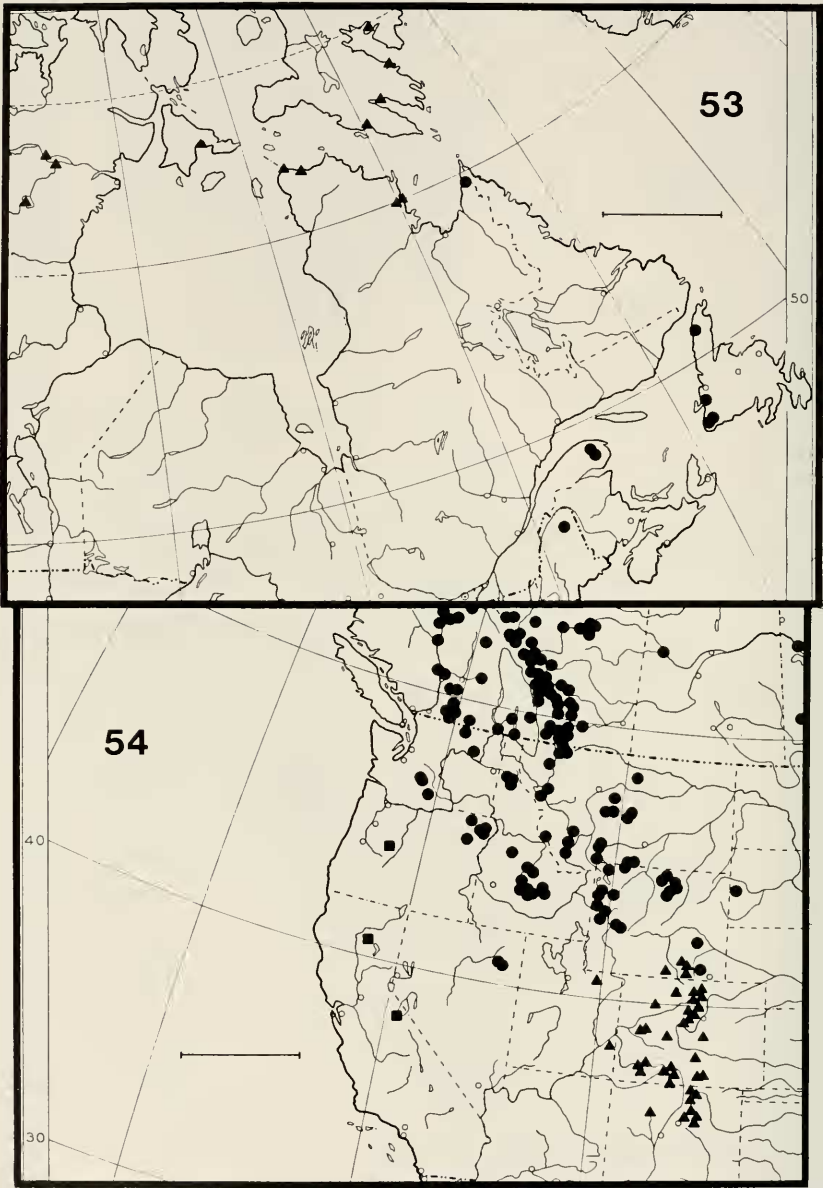
FIGURES 41–45. Median lobe of male genitalia, left lateral aspect. 41. *Nebria arkansana uinta* n.ssp. (Logan River, Utah). 42. *Nebria fragilis teewinot* n.ssp. (Mount Teewinot, Wyoming). 43. *Nebria navajo* n.sp. (19 miles [ca. 31 km] sw of Kayenta, Arizona). 44. *Nebria gebleri fragariae* n.ssp. (Strawberry Mountains, Oregon). 45. *Nebria trifaria utahensis* n.ssp. (Henry Mountains, Utah). Scale line equals 1.0 mm.



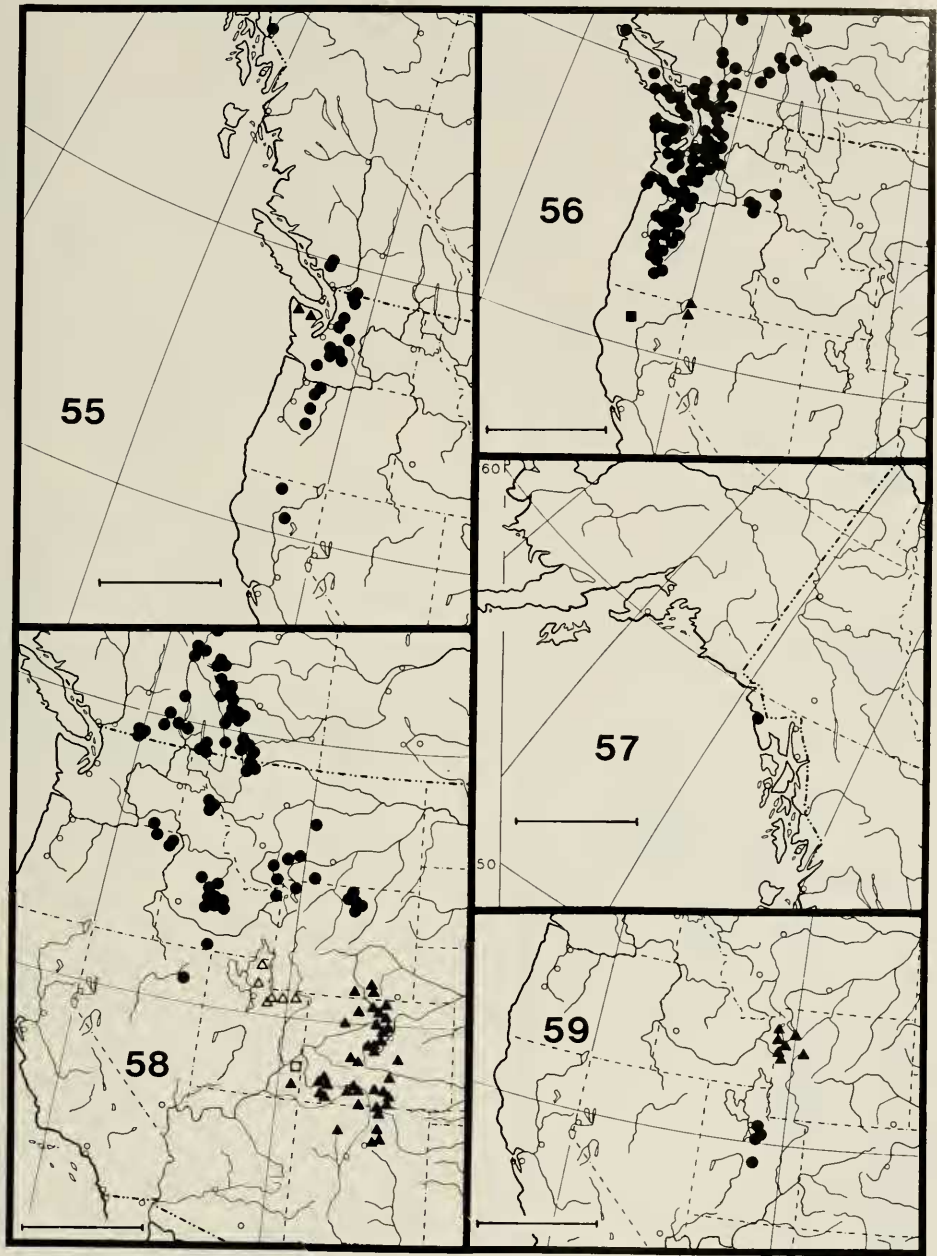
FIGURES 46-50. Bursa copulatrix (a, dorsal aspect; b, left lateral aspect; c, bursal sclerite enlarged, dorsal aspect; d, bursal sclerite enlarged, left lateral aspect); in a. or b., stippled area denotes shape and location of distinct sclerite or moderately to markedly sclerotized, but less clearly defined, area; in c. or d., stippled area denotes weakly sclerotized membrane, sclerite is not stippled. 46. *Nebria acuta quileute* n.ssp. (Olympic Hot Springs, Washington). 47. *Nebria arkansana edwardsi* n.ssp. (Amiskwi Falls, British Columbia). 48. *Nebria arkansana oowah* n.ssp. (La Sal Mountains, Utah). 49. *Nebria gebleri fragariae* n.ssp. (Strawberry Mountains, Oregon). 50. *Nebria trifaria utahensis* n.ssp. (Henry Mountains, Utah). Scale line "x" equals 1.0 mm and applies to all figures "a" and "b." Scale line "y" equals 0.10 mm and applies to all figures "c" and "d."



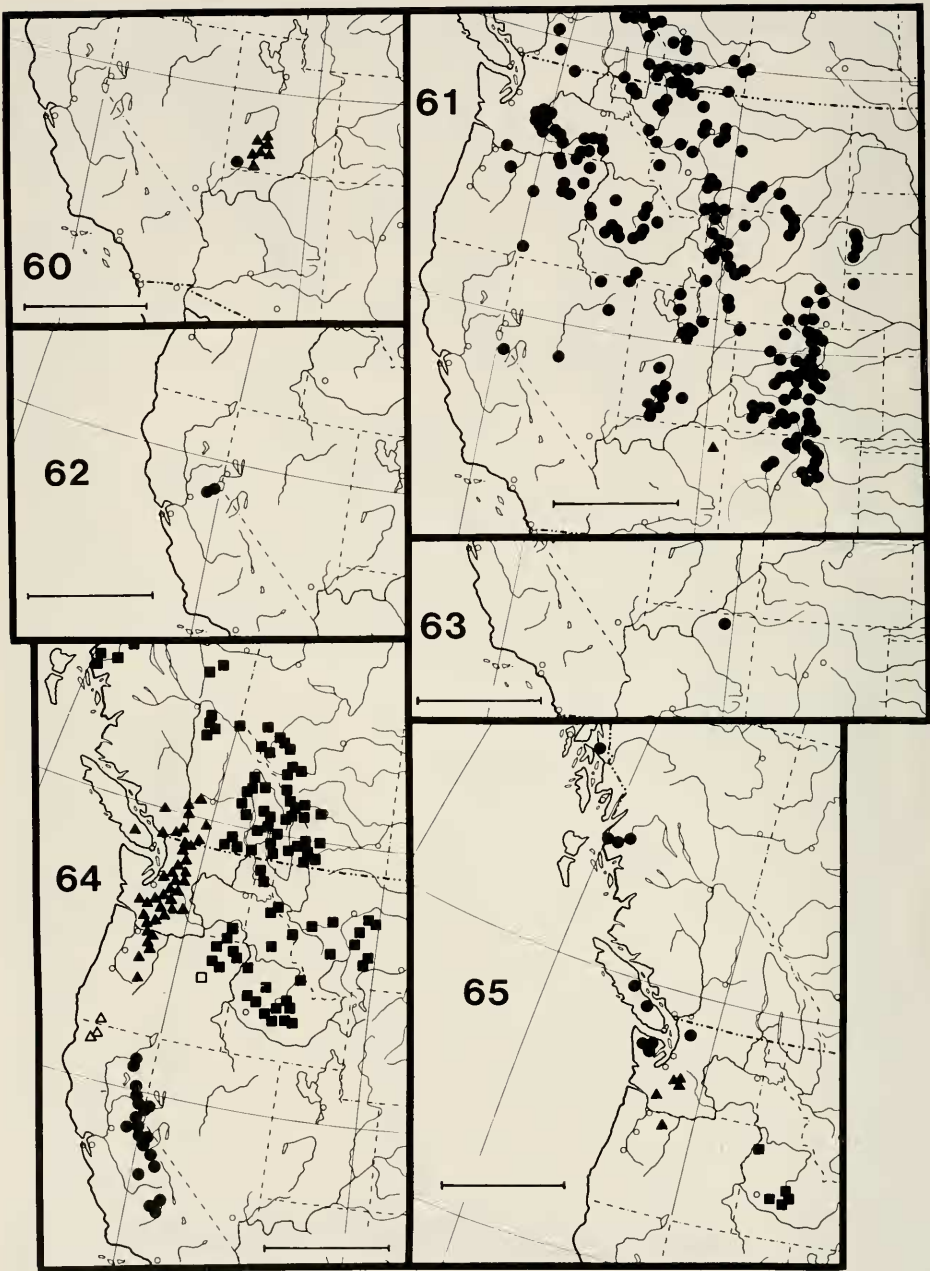
FIGURES 51–52. Geographical distribution maps. 51. *Nebria gouleti* n.sp. 52. *Nebria lacustris* Casey [*N. lacustris lacustris* = solid circles; *N. lacustris bellorum* n.ssp. = solid squares]. All scale lines equal 500 km.



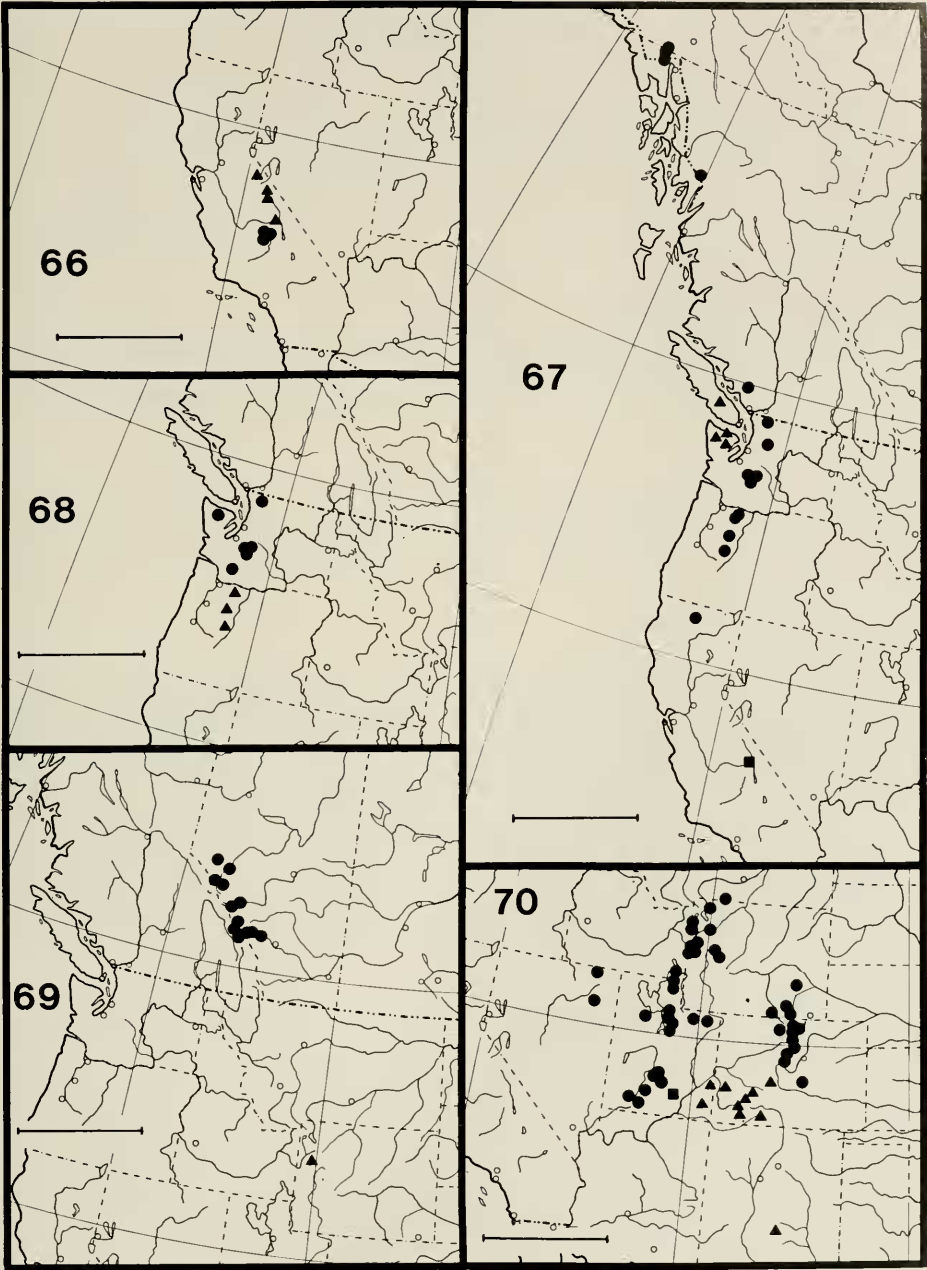
FIGURES 53–54. Geographical distribution maps. 53. *Nebria nivalis* (Paykull) [*N. nivalis nivalis* = solid triangles; *N. nivalis gaspesiana* n.ssp. = solid circles]. 54. *Nebria gyllenhali* (Schönherr) [*N. gyllenhali castanipes* (Kirby) = solid circles; *N. gyllenhali lassenensis* n.ssp. = solid squares; *N. gyllenhali lindrothi* n.ssp. = solid triangles]. All scale lines equal 500 km.



FIGURES 55–59. Geographical distribution maps. 55. *Nebria acuta* Lindroth [*N. acuta acuta* = solid circles; *N. acuta quileute* n.ssp. = solid triangles]. 56. *Nebria sahlbergii* Fischer von Waldheim [*Nebria sahlbergii sahlbergii* = solid circles; *N. sahlbergii modoc* n.ssp. = solid triangles; *N. sahlbergii triad* n.ssp. = solid square]. 57. *Nebria lituyae* n.sp. 58. *Nebria arkansana* Casey [*N. arkansana arkansana* = solid triangles; *N. arkansana edwardsi* n.ssp. = solid circles; *N. arkansana oowah* n.ssp. = open square; *N. arkansana uinta* = open triangles]. 59. *Nebria fragilis* Casey [*N. fragilis fragilis* = solid circles; *N. fragilis teewinot* n.ssp. = solid triangles]. All scale lines equal 500 km.



FIGURES 60–65. Geographical distribution maps. 60. *Nebria zioni* Van Dyke [*N. zioni zioni* = solid triangles; *N. zioni oasis* n.ssp. = solid circle]. 61. *Nebria obliqua* LeConte [*N. obliqua obliqua* = solid circles; *N. obliqua chuskae* n.ssp. = solid triangle]. 62. *Nebria darlingtoni* n.sp. 63. *Nebria navajo* n.sp. 64. *Nebria gebleri* Dejean [*N. gebleri gebleri* = solid squares; *N. gebleri cascadiensis* n.ssp. = solid triangles; *N. gebleri fragariae* n.ssp. = open square; *N. gebleri rathvoni* LeConte = solid circles; *N. gebleri siskiyouensis* = open triangles]. 65. *Nebria carri* n.sp. [solid squares] and *Nebria kincaidi* Schwarz [*N. kincaidi kincaidi* = solid circles; *N. kincaidi balli* n.ssp. = solid triangles]. All scale lines equal 500 km.



FIGURES 66–70. Geographical distribution maps. 66. *Nebria spatulata* Van Dyke [*N. spatulata spatulata* = solid circles; *N. spatulata sierrae* n.ssp. = solid triangles]. 67. *Nebria meanyi* Van Dyke [*N. meanyi meanyi* = solid circles; *N. meanyi lamarkensis* n.ssp. = solid square; *N. meanyi sylvatica* n.ssp. = solid triangles]. 68. *Nebria vandykei* Bänninger [*N. vandykei vandykei* = solid circles; *N. vandykei wyeast* n.ssp. = solid triangles]. 69. *Nebria schwarzi* Van Dyke [*N. schwarzi schwarzi* = solid circles; *N. schwarzi beverlianna* n.ssp. = solid triangle]. 70. *Nebria trifaria* LeConte [*N. trifaria trifaria* = solid circles; *N. trifaria catenata* Casey = solid triangles; *N. trifaria utahensis* n.ssp. = solid square]. All scale lines equal 500 km.